The PHOTOFACT Servicer

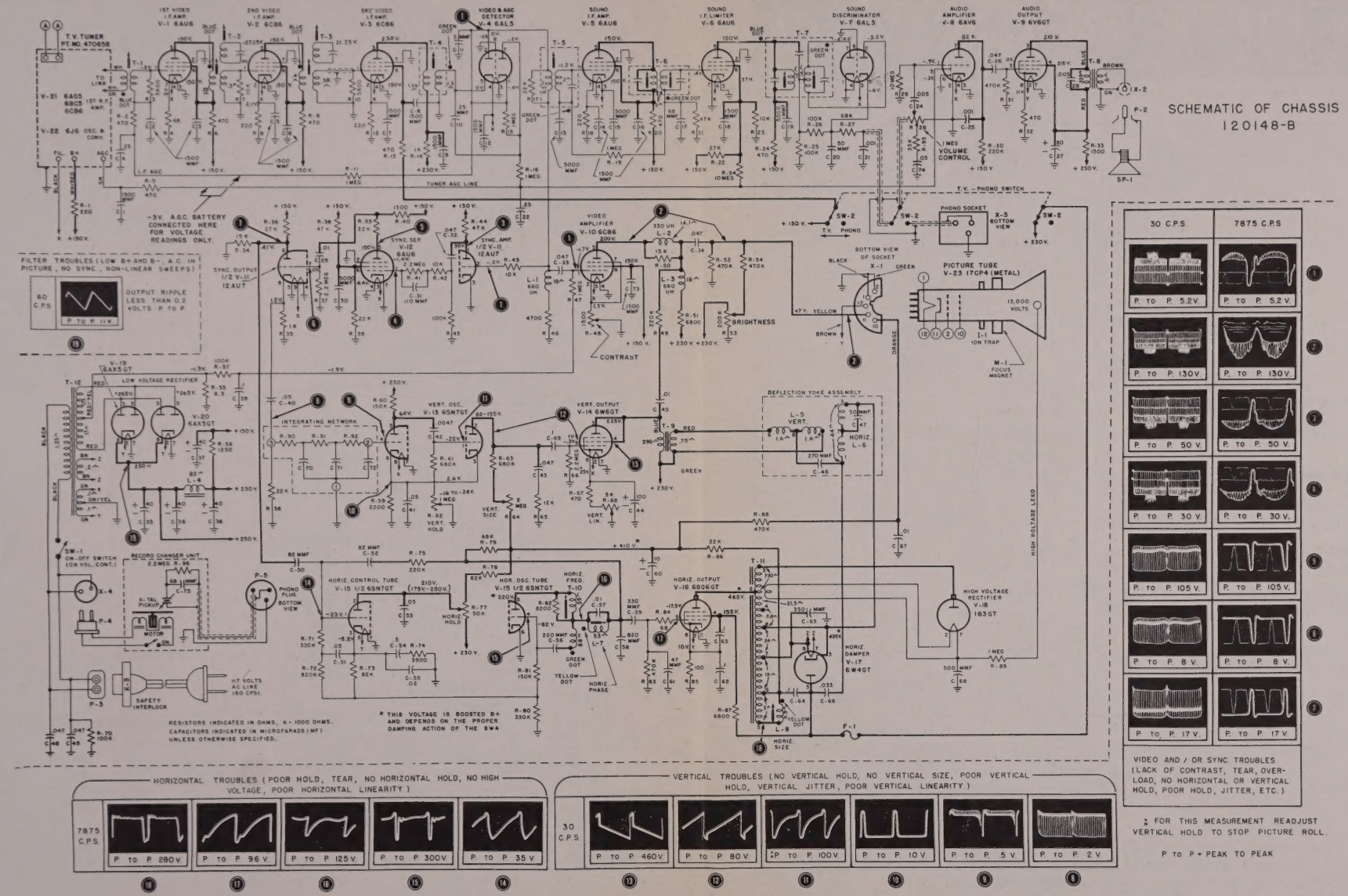
SET 420 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV. 1, 1958

CONTENTS PHOTOFACT SET 420

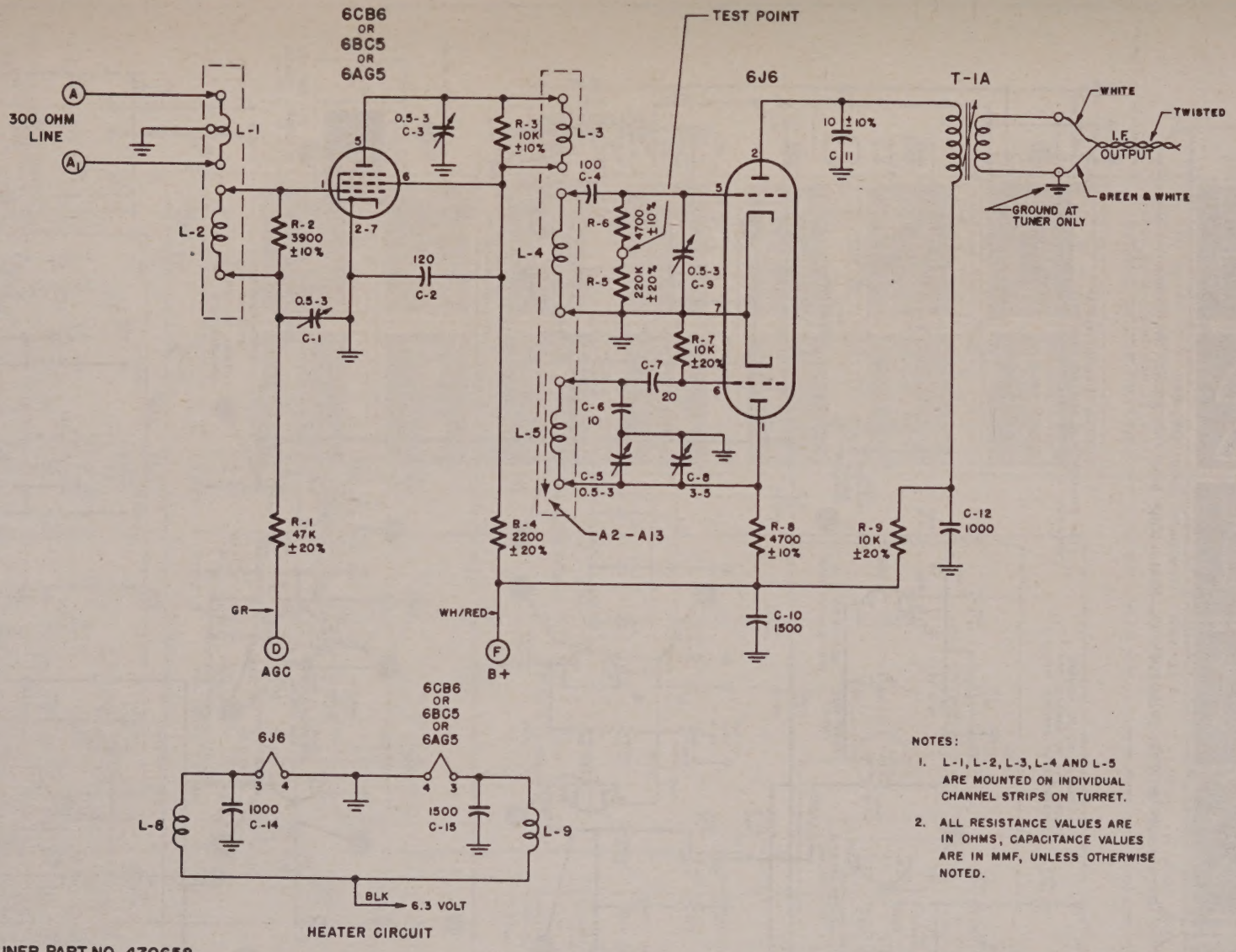
TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
AIRLINE	
GTM-4201A, GTM-4301A	420-1
EMERSON	
1466, 1467, 1470, 1471 (Ch. 120434N, W, 120435P, Y, 120445W, 120446Y)	420-2
RCA VICTOR	
Chassis KCS122A, AD, AE, B, C, D, E, F, H, J, K, L, M, N, P, R	420-3
OTHER EQUIPMENT	
DAVID BOGEN	
K15, K15Y	420-4
DEWALD	
M-804	420-5
OLYMPIC-OPTA	
52804, 52805 "Verona"	420-6
SILVERTONE	
8039, 8041, 8050, A (Ch. 528.53060, 528.53080, 528.53120)	420-7
9076 (Ch. 528.58070, 528.59130, 528.59131, 528.59190, 528.59191) Tape Recorder	420-8
STROMBERG-CARLSON	
AR-415	420-9
SYLVANIA	
4308, 4309 (Ch. 1-621-1, -2)	420-10
TRUETONE	
DC3886A	420-11
V-M	
215	420-12
WILLYS	
815395	420-13
ZENITH	
Royal 1000 (Ch. 9AT40)	420-14

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

EMERSON MODEL 699B CHASSIS 120148-B


SCHEMATIC OF CHASSIS 120148-B
T.V. TUNER PT. NO. 470658
1ST VIDEO I.F.AMP. V-1 6AU6
2ND VIDEO I.F.AMP. V-2 6CB6
3RD VIDEO I.F.AMP. V-3 6CB6
VIDEO & AGC DETECTOR V-4 6AL5
SOUND I.F.AMP. V-5 6AU6
SOUND I.F.LIMITER V-6 6AU6
SOUND DISCRIMINATOR V-7 6AL5
AUDIO AMPLIFIER V-8 6AV6
AUDIO OUTPUT V-9 6V6GT
V-21 6AG5 6BC5 6CB6
1ST R.F. AMP.
V-22 6J6 OSC. & CONV.
TUNER AGC LINE
-3V. A.G.C. BATTERY CONNECTED HERE FOR VOLTAGE READINGS ONLY.
1 MEG VOLUME CONTROL
T.V. - PHONO SWITCH
PHONO SOCKET
SP-1
P-2
X-2
SYNC OUTPUT 1/2 V-11 12AU7
SYNC. SER. V-12 6AU6
SYNC. AMP. 1/2 V-11 12AU7
VIDEO AMPLIFIER V-10 6CB6
CONTRAST
BRIGHTNESS
PICTURE TUBE V-23 17CP4 (METAL)
13,000 VOLTS
ION TRAP
FOCUS MAGNET
DEFLECTION YOKE ASSEMBLY
VERT. OSC. V-13 6SN7GT
VERT. OUTPUT V-14 6W6GT
INTEGRATING NETWORK
VERT. SIZE
VERT. HOLD
VERT. LIN.
LOW VOLTAGE RECTIFIER V-19 6X8S GT
V-20 6AX5GT
SW-1 ON-OFF SWITCH (ON VOL. CONT.)
RECORD CHANGER UNIT
X-TAL PICKUP
MOTOR
PHONO PLUG BOTTOM VIEW
HORIZ. CONTROL TUBE V-15 1/2 6SN7GT
HORIZ. OSC. TUBE V-15 1/2 6SN7GT
HORIZ. FREQ.
HORIZ. HOLD
HORIZ. PHASE
HORIZ. OUTPUT V-16 6BQ6GT
HORIZ. DAMPER V-17 6W4GT
HIGH VOLTAGE RECTIFIER V-18 1B3GT
HIGH VOLTAGE LEAD
SAFETY INTERLOCK
117 VOLTS AC LINE (60 CPS)
RESISTORS INDICATED IN OHMS, K = 1000 OHMS. CAPACITORS INDICATED IN MICROFARADS (MF) UNLESS OTHERWISE SPECIFIED.
* THIS VOLTAGE IS BOOSTED B+ AND DEPENDS ON THE PROPER DAMPING ACTION OF THE 6W4
FILTER TROUBLES (LOW B+ AND B-, A.C. IN PICTURE, NO SYNC., NON-LINEAR SWEEPS)
60 C.P.S.
OUTPUT RIPPLE LESS THAN 0.2 VOLTS P TO P
P TO P 11 V.
30 C.P.S.
7875 C.P.S.
P TO P 5.2 V.
P TO P 130 V.
P TO P 50 V.
P TO P 30 V.
P TO P 105 V.
P TO P 8 V.
P TO P 17 V.
VIDEO AND / OR SYNC TROUBLES (LACK OF CONTRAST, TEAR, OVERLOAD, NO HORIZONTAL OR VERTICAL HOLD, POOR HOLD, JITTER, ETC.)
HORIZONTAL TROUBLES (POOR HOLD, TEAR, NO HORIZONTAL HOLD, NO HIGH VOLTAGE, POOR HORIZONTAL LINEARITY)
7875 C.P.S.
P TO P 280 V.
P TO P 96 V.
P TO P 125 V.
P TO P 300 V.
P TO P 35 V.
VERTICAL TROUBLES (NO VERTICAL HOLD, NO VERTICAL SIZE, POOR VERTICAL HOLD, VERTICAL JITTER, POOR VERTICAL LINEARITY)
30 C.P.S.
P TO P 460 V.
P TO P 80 V.
P TO P 100 V.
P TO P 10 V.
P TO P 5 V.
P TO P 2 V.
‡ FOR THIS MEASUREMENT READJUST VERTICAL HOLD TO STOP PICTURE ROLL.
P TO P = PEAK TO PEAK

SCHEMATIC DIAGRAM COURTESY EMERSON RADIO AND PHONOGRAPH CORP.



NOTES:

1. L-1, L-2, L-3, L-4 AND L-5 ARE MOUNTED ON INDIVIDUAL CHANNEL STRIPS ON TURRET.
2. ALL RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MMF, UNLESS OTHERWISE NOTED.

TUNER PART NO. 470658

SCHEMATIC PART NO. 950177

TUNER No. 470658
EMERSON MODEL 699B CHASSIS 120248 -B

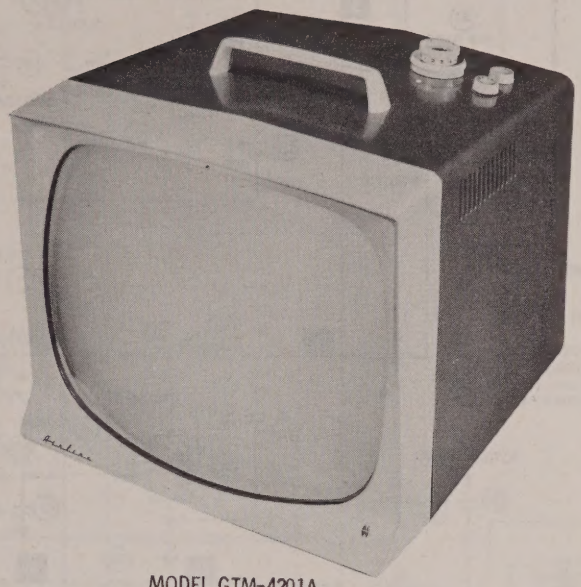
PHOTOFACT* Folder with CIRCUITRACE*
*TRADE MARK

AIRLINE MODELS GTM-4201A, GTM-4301A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Pull out 4 top knobs approximately 1" to disengage from control shafts. Knobs cannot be removed.
2. Remove 7 metal screws holding rear cover. Remove rear cover.
3. Remove 2 snap buttons holding antenna terminal board.
4. Remove picture tube socket, HV and speaker leads, and yoke clamp. Remove yoke.
5. Remove 2 hex nuts holding speaker. Remove speaker.
6. Remove 2 metal screws holding chassis at the top.
7. Remove 4 bottom metal chassis bolts.
8. Remove chassis.



MODEL GTM-4201A

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Airline	MODELS	GTM-4201A, GTM-4301A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING	115 Watts, 1.17 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from the bottom of the front holding the front. Remove front by pulling out and up at the bottom.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R72) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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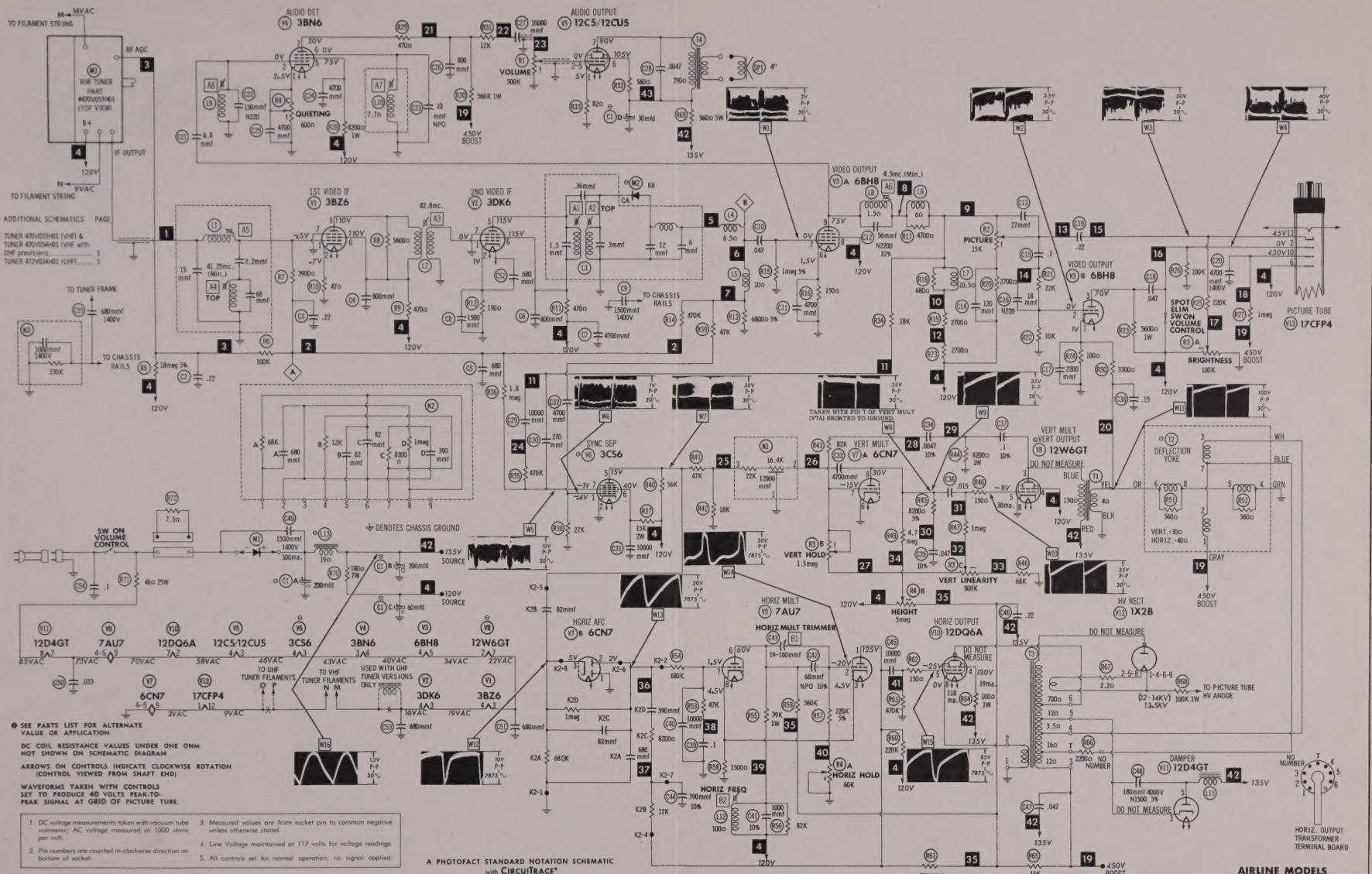
AIRLINE MODELS GTM-4201A, GTM-4301A
AIRLINE MODELS GTM-4201A, GTM-4301A
SET 420 FOLDER 1


AUDIO DET V4 3BN6
AUDIO OUTPUT V5 12C5/12CU5
VOLUME 500K
QUIETING
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3DK6
VIDEO OUTPUT V3A 6BH8
VIDEO OUTPUT V3B 6BH8
PICTURE 15K
BRIGHTNESS 100K
SPOT ELIM SW ON VOLUME CONTROL
PICTURE TUBE V13 17CFP4
SYNC SEP V6 3CS6
VERT MULT V7A 6CN7
VERT MULT V7B 6CN7
VERT OUTPUT V8 12W6GT
VERT HOLD 1.5meg
VERT LINEARITY 500K
HEIGHT 5meg
DEFLECTION YOKE
HORIZ AFC V7B 6CN7
HORIZ MULT V9 7AU7
HORIZ MULT TRIMMER
HORIZ OUTPUT V10 12DQ6A
HV RECT V12 1X2B
HORIZ HOLD 60K
HORIZ FREQ
DAMPER V11 12D4GT
TO PICTURE TUBE HV ANODE
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
SW ON VOLUME CONTROL
TO TUNER FRAME
TO CHASSIS RAILS
TO FILAMENT STRING
RF AGC
IF OUTPUT
VHF TUNER PART #470V053H01 (TOP VIEW)
TO UHF TUNER FILAMENTS
TO VHF TUNER FILAMENTS
USED WITH UHF TUNER VERSIONS ONLY
DENOTES CHASSIS GROUND
12D4GT 7AU7 12DQ6A 12C5/12CU5 3CS6 3BN6 6BH8 12W6GT
6CN7 17CFP4 3DK6 3BZ6
DO NOT MEASURE
ADDITIONAL SCHEMATICS PAGE
TUNER 470V053H01 (VHF) & TUNER 470V054H01 (VHF with UHF provisions..... 5
TUNER 472V034H01 (UHF)..... 5
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 40 VOLTS PEAK-TO-PEAK SIGNAL AT GRID OF PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*
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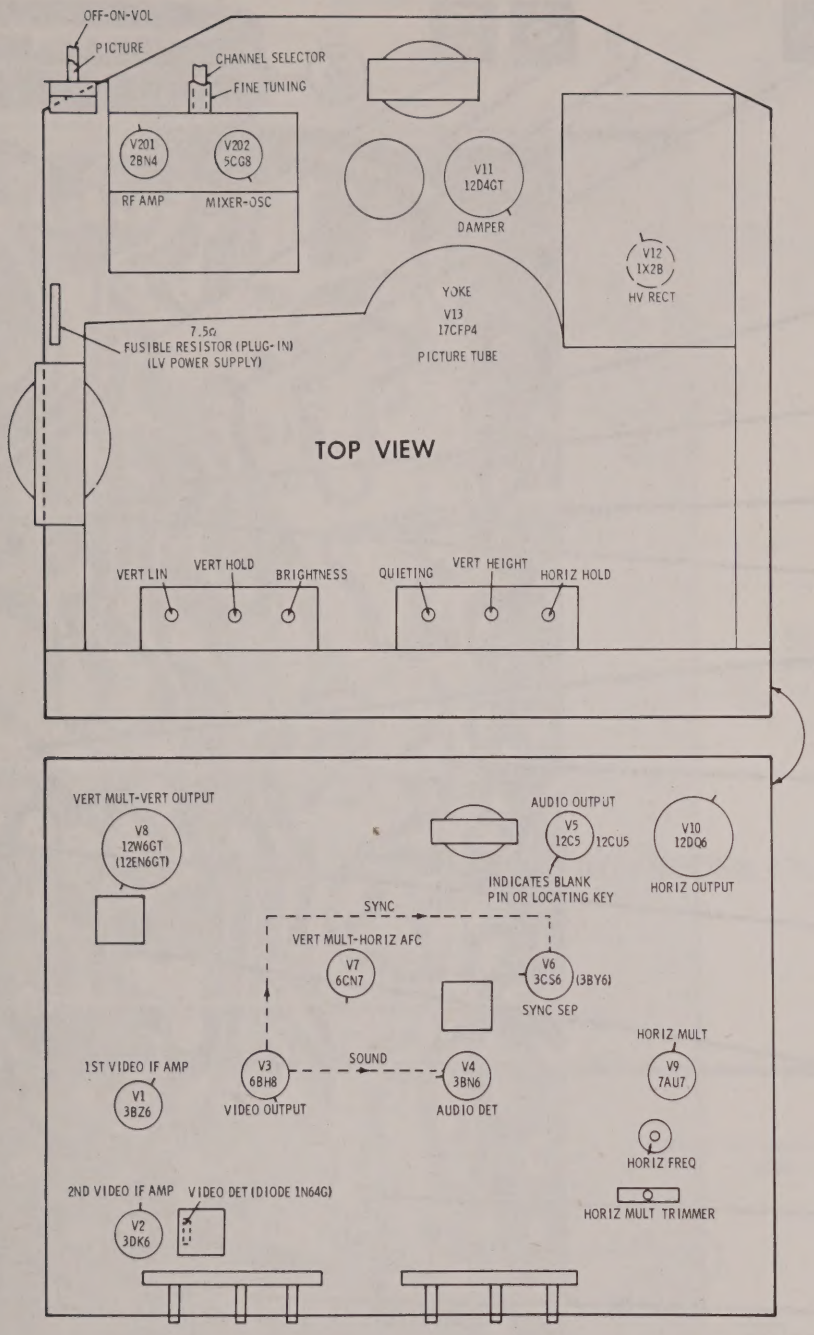
AIRLINE MODELS
GTM-4201A, GTM-4301A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

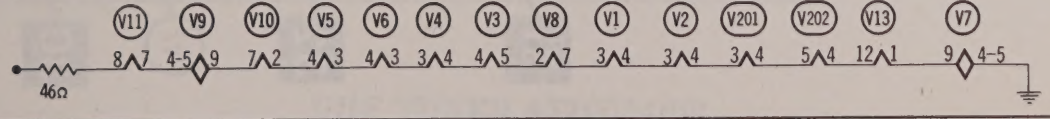
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

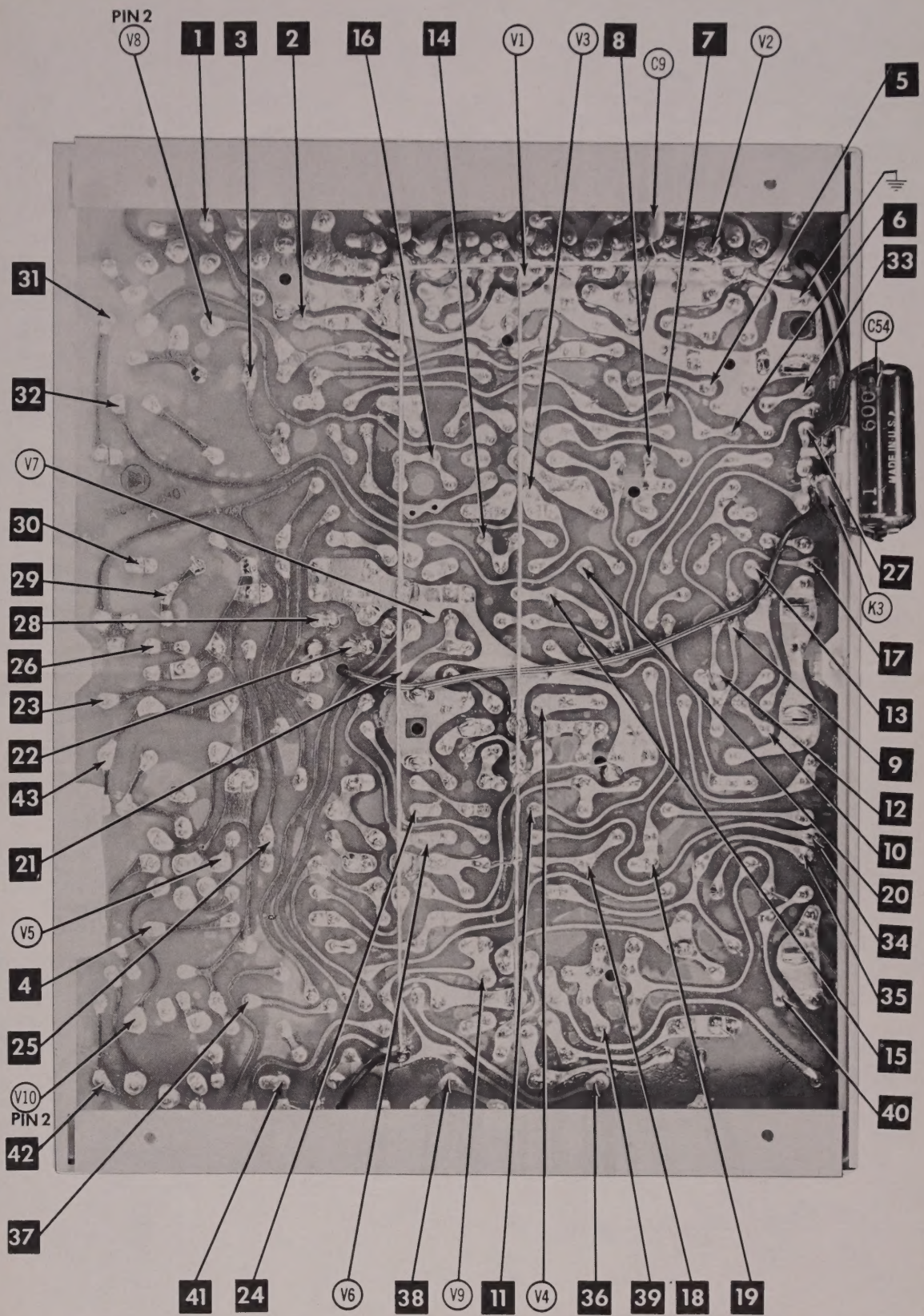
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (R72), Rectifier (M1)

SWEEP FAILURE
No raster, has sound V7, V9, V10, V11, V12, V13, M1
No vertical deflection V7, V8
Poor vert. linearity or foldover V7, V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, M1
Vert. off freq. V7, V8
Horiz. off freq. V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (M2), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6, V7
No vert. or horiz. sync V6





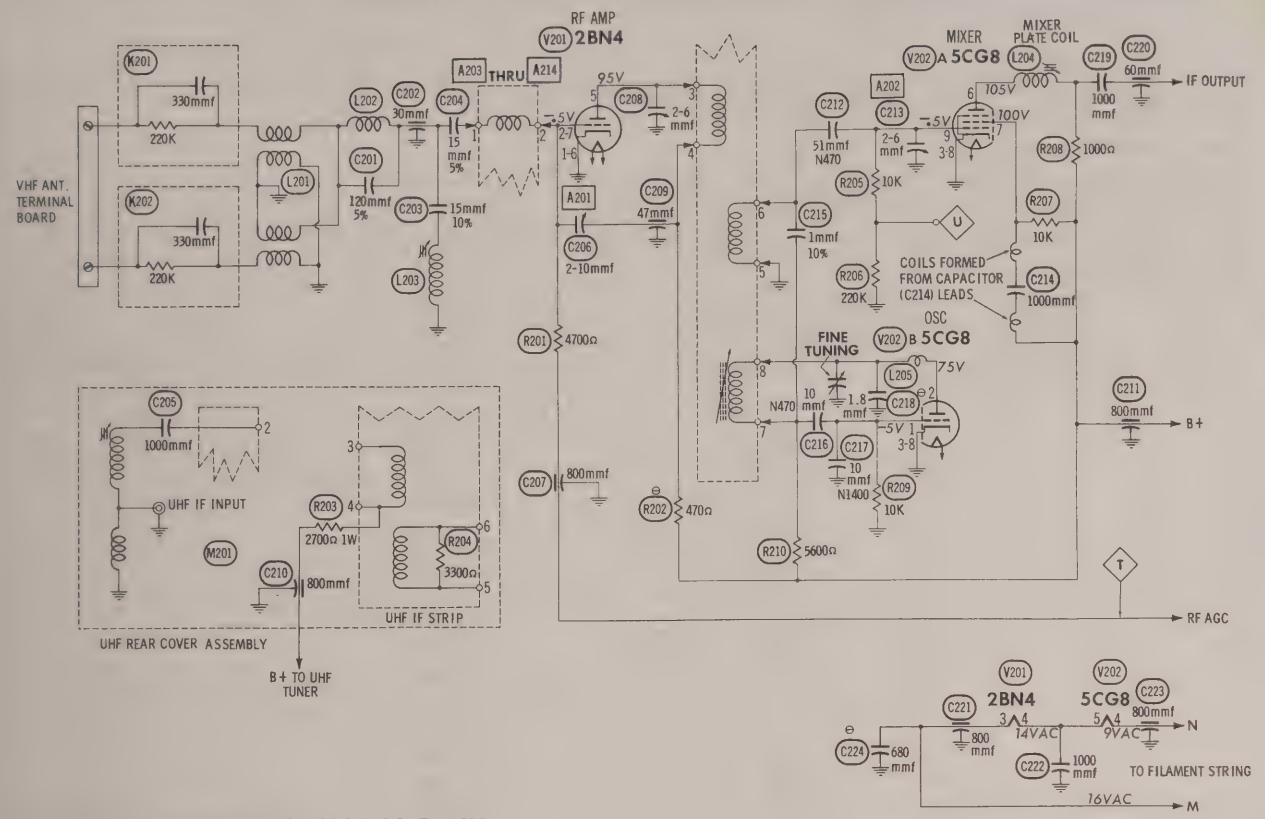
A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

AIRLINE MODELS
GTM-420A, GTM-430A

FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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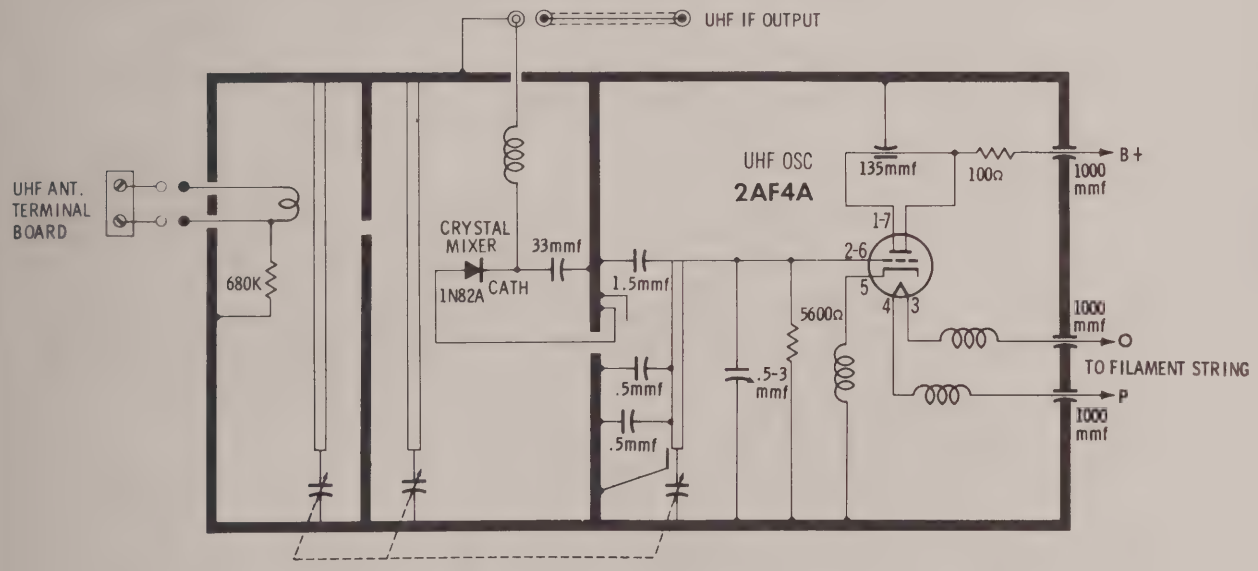
VHF TUNER 470V053H01-VHF W/UHF PROVISIONS 470V054H01



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER 472V034H01

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ . Positive to chassis.
Temporarily detune the Mixer Plate Coil to remove "Kick back" from response.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓤ . Low side to chassis.	A201, A202	Adjust for response curve similar to Fig.201 with markers above 90%.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A203	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A204	
			201MC	199.25MC 203.75MC	11		A205	
			195MC	193.25MC 197.75MC	10		A206	
			189MC	187.25MC 191.75MC	9		A207	
			183MC	181.25MC 185.75MC	8		A208	
			177MC	175.25MC 179.75MC	7		A209	
			85MC	83.25MC 87.75MC	6		A210	
			79MC	77.25MC 81.75MC	5		A211	
			69MC	67.25MC 71.75MC	4		A212	
			63MC	61.25MC 65.75MC	3		A213	
			57MC	55.25MC 59.75MC	2		A214	

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

FIG. 201

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282 or 8606
Walsco #2543

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect a 470mmf capacitor across the input leads of the scope and VTVM.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 2nd. Video IF Amp. (V2). Low side to chassis.	45.0MC (10MC Swp)	44.5MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis. (Across Video Det. load)	A1, A2	Adjust A1 to peak at marker and A2 to rock curve for symmetrical shape.
2.	"	High side to pin 1 (grid) of 1st. Video IF Amp. (V1). Low side to chassis.	Not used	42.8MC (Unmod)	"	USE VTVM. DC probe thru 47K to point Ⓑ . Common to chassis. (Across Video Det. load)	A3	Adjust for maximum deflection.
3.	"	"	45.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis. (Across Video Det. load)		Retouch A1 thru A3 for response similar to Fig. 1. Use no more signal than necessary to provide 2 volts peak to peak on scope.
4.	"	"	Not used	41.25MC (Unmod)	"	USE VTVM. DC probe thru 47K to point Ⓑ . Common to chassis. (Across Video Det. load)	A4	Adjust for MINIMUM deflection.
5.	Direct	Across antenna terminals.	"	215.75MC	13	"	Fine Tuning	"
6.	"	"	213MC	211.25MC	"	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis. (Across Video Det. load)	Mixer Plate Coil & A5	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Peak Mixer Plate Coil at center of response curve. Adjust A5 for symmetry.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001mfd	High side to point Ⓑ . Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector probe to pin 11 (cathode) of picture tube. Common to chassis.	A6	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the DC probe of the VTVM thru 4.5MC detector probe (Fig. 3) to pin 2 (grid) of the Audio Detector (V4). Common to chassis.
Tune in the strongest TV signal available and set the Quieting Control (R4C) to the center of its range.
Set the Volume at a low level and adjust A7 for maximum volume.
Reduce the signal strength. Use either loose coupling or an attenuator pad at the antenna terminals. Adjust A8 for maximum negative voltage on the VTVM.
Reduce the volume to a low sound level and attenuate the signal at the antenna terminals until a negative reading of 1 volt is obtained on the VTVM. Readjust A7 for maximum volume.
Turn the Fine Tuning away from best picture to the point where -1.5 volts is obtained on the VTVM. (It may be necessary to misadjust the tuner oscillator slug to accomplish this. If so, be sure to readjust Oscillator when finished.) Adjust the Quieting Control for MINIMUM buzz.

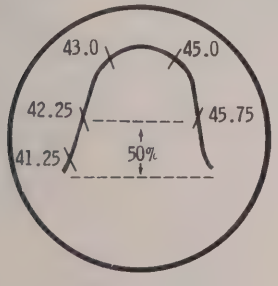


FIG. 1

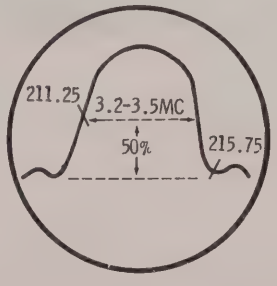


FIG. 2

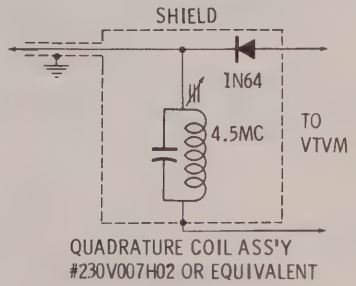
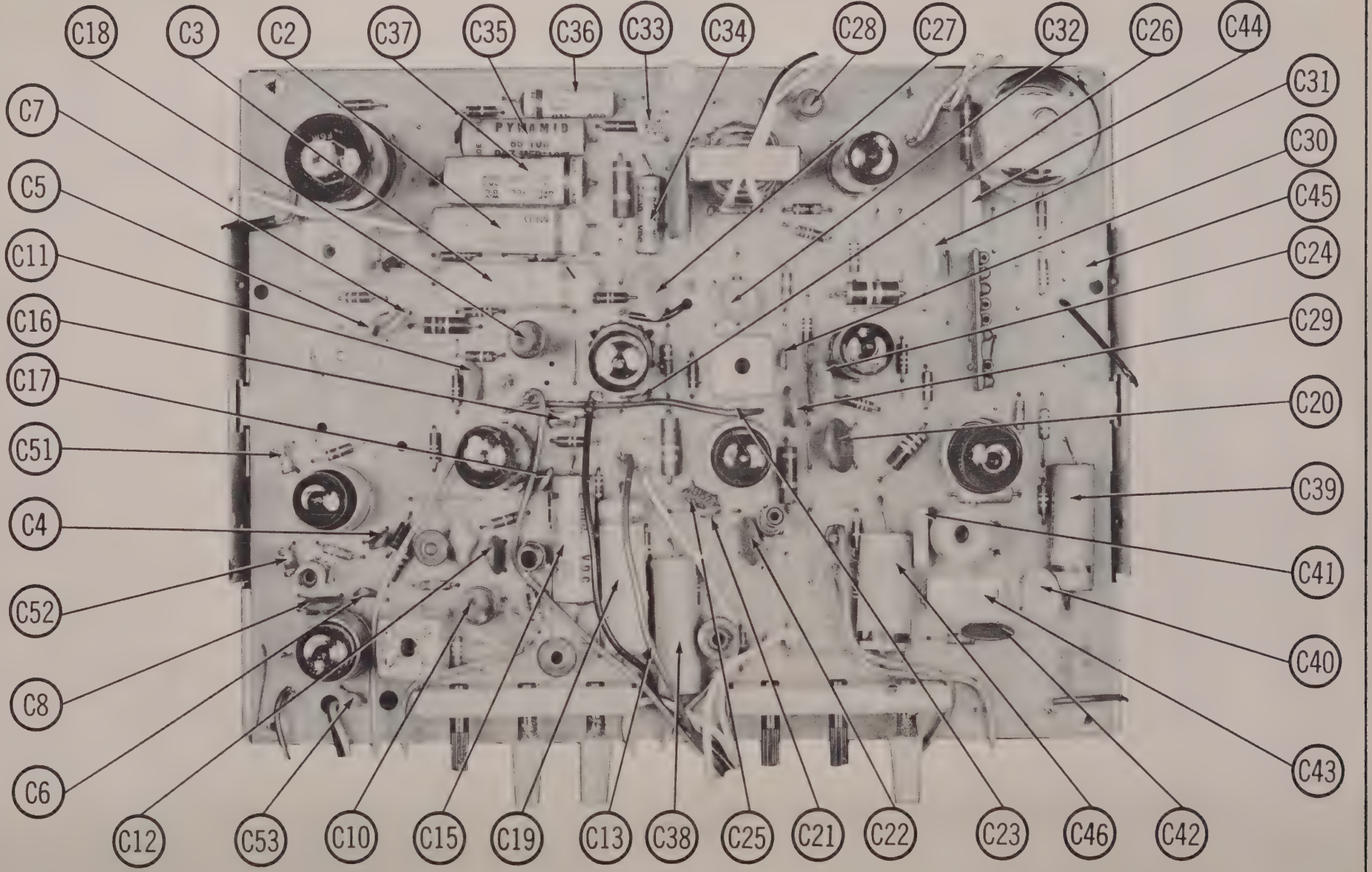
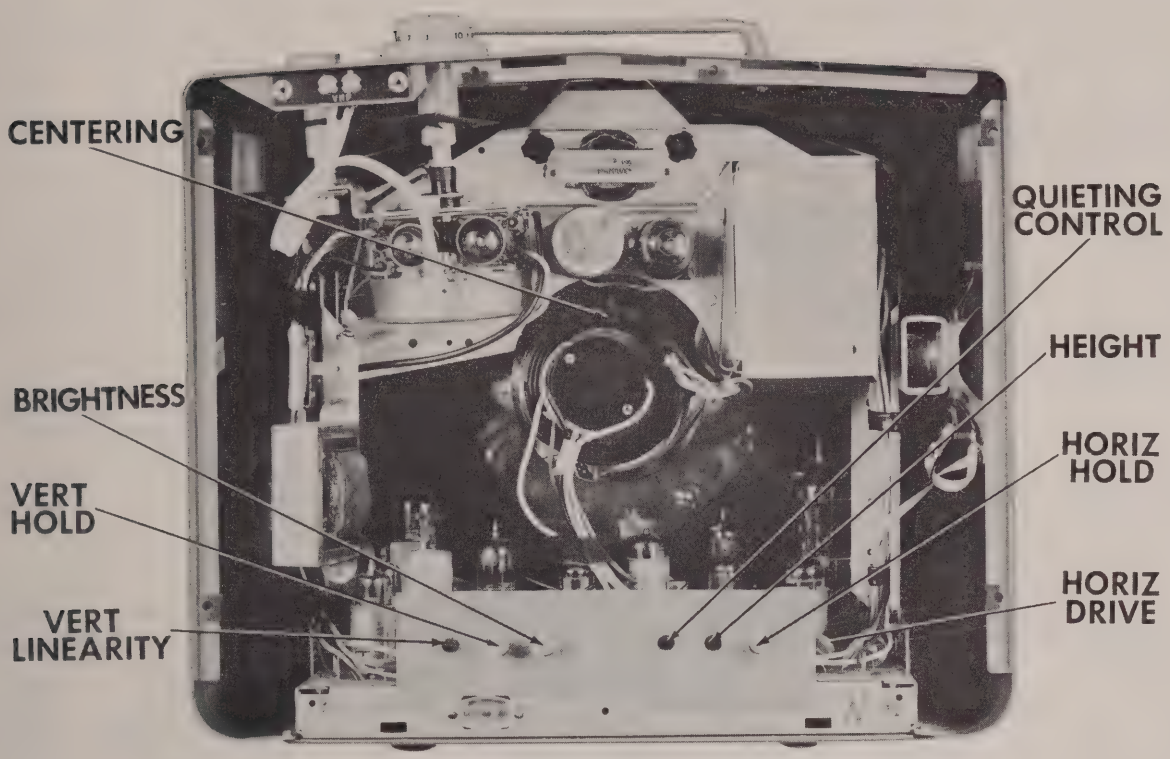


FIG. 3



PRINTED BOARD-CAPACITOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested alignment tools:
B1 ... General Cement #5003, 5004, 5008 or 8276
Walsco #2520, 2525 or 2537
B2 ... General Cement #8282 or 8606
Walsco #2543

Connect a clip lead across the Horizontal Frequency coil (L12). This may be done from the top of the chassis.

Set the Horizontal Hold (R4A) to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of the Horizontal Multivibrator (V9). Common to chassis.

With the receiver tuned to a TV signal, adjust the Horizontal Multivibrator Trimmer (B1) for zero reading on the VTVM. If zero can be approached but not quite reached at one extreme of B1, it may be necessary to set the Horizontal Hold SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L12.

Adjust the Horizontal Frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. Video IF Amp	3DT6	
V2	2nd. Video IF Amp	3DT6	
V3	Video Output	6BH6	
V4	Audio Det	3BN6	
V5	Audio Output	2C53	
		2C53	
V6	Sync Sep	3C50	*3BY6

ITEM No	USE	TYPE	NOTES
V7	Vert. Mult.-Horiz. AFC	6CN7	
V8	Vert. Mult.-Vert. Output	12W6GT	*12FN6GT
V9	Horiz. Mult.	6AL5	
V10	Horiz. Output	12DQ6A	
V11	Damper	12DM6T	
V12	HV Rect	1X2D	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V13	17CEP4			17CEP4 [1]	[1] Silver Screen 85°

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	75	214V018H02 [1]	AFHS4-01-55	XDM05				TVLS-4450
B	200	75							
C	450	75							
D	50	450							

[1] Alternate Part #218V018H01

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	.22	600		P488N-22		CUB4P23	GEM-4022	4TM-P22	
C2	.22	600		P488N-22		CUB4P23	GEM-4022	4TM-P22	
C3	800			BPD-0008	DD-801	L10T8		5GA-T8	
C4	680		215V116A01	BPD-00068	DD-681	L10T68	UC-5389	5GA-T68	
C5	800			BPD-0008	DD-801	L10T8		5GA-T8	
C7	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C8	1800		215V300H28	BPD-0015	DD-153	BYA10D15	DC5215	5HK-D15	
C9	1500	1400	215V301A52	HVD-15-1500	DD16-153	HVC16D15			
C10	.047	400		P488N-047		BC5547J	ACE6147	4SE-S47	
C11	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C13	56								N2200 10%
C13	27		SI 27	DS-270		LT8Q27	UC-5427	5GA-Q27	
C14	130		215V300E43	DI-00132	DD-131	L10T13	UC-5313	5GA-T13	
C15	.1	600		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C16	18								N220
C17	2200			BPD-0022	DD-222	BYA10D22	UC-5222	5GA-D22	
C18	.047	400		P488N-047	DF-503	BC5547J	ACE6147	4SE-S47	
C19	.22	400		P488N-22		CUB4P23	GEM-4022	4TM-P22	
C20	4700	1400	215V300H01	DAC-8	DD30-472	HVC16D47			
C21	6.8			NPO-SI 6.8	TCZ-6R8	CTA6V68C	ZT-5568	5TCCB-V68	
C22	150								N220
C23	10		215V12A00	NPO-DI 10	DTZ-10	C10QIC	ZT-541	5TCC-Q1	NPO
C24	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C25	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C26	800			BPD-0008	DD-801	L10T8	UC-538	5GA-T8	
C27	10000		215V11A03	BPD-01	DD-103	BYA5S	DC511	5HK-S1	
C28	.0047	600		P668N-047		BC6D47J	ACE6247	6SE-D47	
C29	10000			BPD-01	DD-103	BYA5S	DC511	5HK-S1	
C30	10000			BPD-00027	DD-271	L10T27	UC-5327	5GA-T27	
C31	10000		215V11A03	BPD-01	DD-103	BYA5S	DC511	5HK-S1	
C32	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C33	4700		215V300H04	BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C34	.0047	600					GEM-16247		10%
C35	.047	600							10%
C36	.025	400		P488N-015	DD16-153	CUB4S25	GEM-4115	4TM-S25	
C37	.1	600							10%
C38	.15	400		P488N-15		CUB4P15	GEM-4015	4TM-P15	
C39	.1	600		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C40	10000			BPD-01	DD-103	BYA5S	DC511	5HK-S1	
C41	1000		215V131H02			1R5D1	MCB225	MS-21	10%
C42	68		215V126A90	NPO-DI 68	DTZ-68	C10Q68C		5TCC-Q68	NPO 10%
C43	2200		215V222H01						
C44	390		215V133H56		DD-391	5R5T39		MS-339	10%
C45	10000		215V11A03	BPD-01	DD-103	BPD-01	DC511	5HK-S1	
C46	.22	400		P488N-22		CUB4P23	GEM-4022	4TM-P22	
C47	.047	600		P668N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C48	180	4000	215V300H30						N1500 5%
C49	1500	1400	215V201A52	HVD-15-1500	DD30-152	HVC16D15			
C50	.033	600		P668N-033		CUB6S33	GEM-6133	6TM-S33	
C51	680		215V116A81	SI-680	DS-681	LT6T68	UC-5368	5GA-T68	
C52	680		215V116A81	SI-680	DS-681	LT6T68	UC-5368	5GA-T68	
C53	680		215V116A81	SI-680	DS-681	LT6T68	UC-5368	5GA-T68	
C54	.1	600		P668N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C55	680	1400	215V206A81	HVD-15-680	DD30-681	HVB16T68			

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AIRLINE PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	270V043H01	B-60	A47-500K-Z		U48	Volume
B	Shaft			Not Req.	FS-3		Not Req.	
C	Switch			KB-3 or KR-3*	SWE-21		US-20	On-Off & Spot Eliminator
R2A	.5K	1	270V003H07	B-22	A47-15K-S	QU-119	U38	Picture
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	100K	1	270V019H07					Brightness
B	5meg	"						Vert. Hold
C	500K	"						Vert. Lin.
R4A	60K	1	270V019H06					Horiz. Hold
B	5meg	"						Height
C	500K	"						Quieting

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R5	18meg 5%			
R6	100K			
R7	3900Ω			
R8	5600Ω			
R9	470Ω			
R10	47Ω			
R11	470Ω			
R12	150Ω			
R13	6800Ω 5%			
R14	470K			
R15	1meg 5%			
R16	150Ω			
R17	4700Ω			
R18	680Ω			
R19	2700Ω			
R20	2700Ω			
R21	22K			
R22	10K			
R23	5600Ω	1		
R24	100Ω			
R25	220K			
R26	100K			
R27	1meg			
R28	8200Ω	1		
R29	470Ω			
R30	560K	1		
R31	12K			
R32	580Ω			
R33	62Ω			
R34	18K			
R35	470K			
R36	1.8meg			
R37	15K	2		
R38	27K			
R39	47K			

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R40	56K			
R41	47K			
R42	18K			
R43	82K			
R44	8200Ω	1		
R45	8200Ω 5%			
R46	150Ω			
R47	1meg			
R48	68K			
R49	4.7meg			
R50	3300Ω			
R51	560Ω			
R52	560Ω			
R53	47K			
R54	680K			
R55	39K	1		
R56	82K			
R57	220K 5%			
R58	1500Ω			
R59	560K			
R60	220K			
R61	330K	1		
R62	150Ω			
R63	470K			
R64	100Ω	1		
R65	15K			
R66	2200Ω			
R67	2.2Ω		251V002A29	
R68	100K	1		
R69	560Ω	5	251V020H53	
R70	180Ω	7	251V020H52	
R71	46Ω	25	251V017H3	
R72	7.5Ω		259V007H02	
R73	2700Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st. Video IF	235V003H01					Includes Caps.
	41.25MC Trap						
L2	2nd. Video IF	235V004H01					
L3	3rd. Video IF	235V022H01					
L4	Series Peaking Coil	V-15796-1	19-3100	TV-181	6112	VP-3	100 Microhenries
L5	Shunt Peaking Coil	230V019H12	19-3250	TV-185	6161	VP-6	230 Microhenries
L6	Series Peaking Coil	230V010H02	19-3180	TV-184	6160	VP-5	170 Microhenries
L7	Shunt Peaking Coil	230V010H09	19-3800	TV-203	6174	VP-8	500 Microhenries
L8	4.5MC Trap	V-15796-1					
L9	Ist. Sound IF	V-15796-2					
L10	Quadrature Coil	230V007H03					
L11	RF Choke	230V016H10	19-1006				14 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	DC RES SEC.	AIRLINE PART No.	REPLACEMENT DATA: Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L12	100Ω		230V005A01						

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE @ CURRENT 1000 ~(.)	REPLACEMENT DATA: AIRLINE PART No	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L13	250A	19Ω	43 Hy.	430V032H04						C-34X
		18Ω	.43 Hy.	430V032H01 [1]						C-24X

[1] Alternate Part Number.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	430V053H01	21900 [1]					26S70 [2]	
T2	Yoke-Horiz. (21MH) (90°)-Vert. (36MH)	490V001H04 [3]	DF-60T [4] [5]	MDF-92 [4] [5]	T90F19/43 [4] [5]	PMC2045 [4] [5]	DY-16A [4] [5]	Y-16 [4] [5]	Y-4 & NW6 [4]
	Alt. Yoke	496V003H09							
	Rear Cover & Centering Device	78LV063H02							YC-1 & CL-1
	Alt. Rear Cover & Centering Device	V-15996-2							
	Yoke Clamp	76BV014H04							
T3	Horiz. Output	493V004H08							

[1] Use 5 : 1 turns ratio.
[2] Drill new mounting hole(s).
[3] Includes R51, R52.
[4] Connect same as original.
[5] Use original rear cover and centering device. Use original yoke damping network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T4	2400Ω	3-4Ω	430V031H01	Z2101 [1]	A-3025 [1]	AU-605 [1]	A-3333 [1]	26S58 [1]	S-12X [1]	[1] Use original channel frame

SPEAKER

ITEM No	TYPE SIZE	TYPE FIELD	TYPE V C IMP	REPLACEMENT DATA: AIRLINE PART No	QUAM PART No	NOTES
SP1	4"	PM	3-4Ω	570V039H01	4A07	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	AIRLINE PART No	REPLACEMENT DATA
K1	Vert. Integrator	12000mmf, 22K, 16.4K	219V003H01	Aerovox PA-110 Centralab PC-104 Cornell-Dubilier 115TM1 Sprague V-3
K2	Horiz. AFC Circuit	680mmf, 82mmf, 82mmf, 390mmf, 68K, 12K, 8200Ω, 1meg	219V002H03	
K3	Chassis Isolation	1000mmf [1] 1400V, 330K	219V004H03	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: AIRLINE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.300A	295V006H03 [1]		1N1008 [2]	SD-94 [1]	M600 [1]	[1] Silicon Type. [2] Germanium Type.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	KS *	V-10916-3	1N64	1N90	Video Detector (Pigtail) * Some versions may use 1N64G or 1N295 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuner	470V033H01	VHF (Standard Coil #FNS-089)
	Tuner	470V054H01	VHF With UHF Provisions (Standard Coil #FNS-090)
	Tuner	472V034H01	UHF
	Printed Board	550V044H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

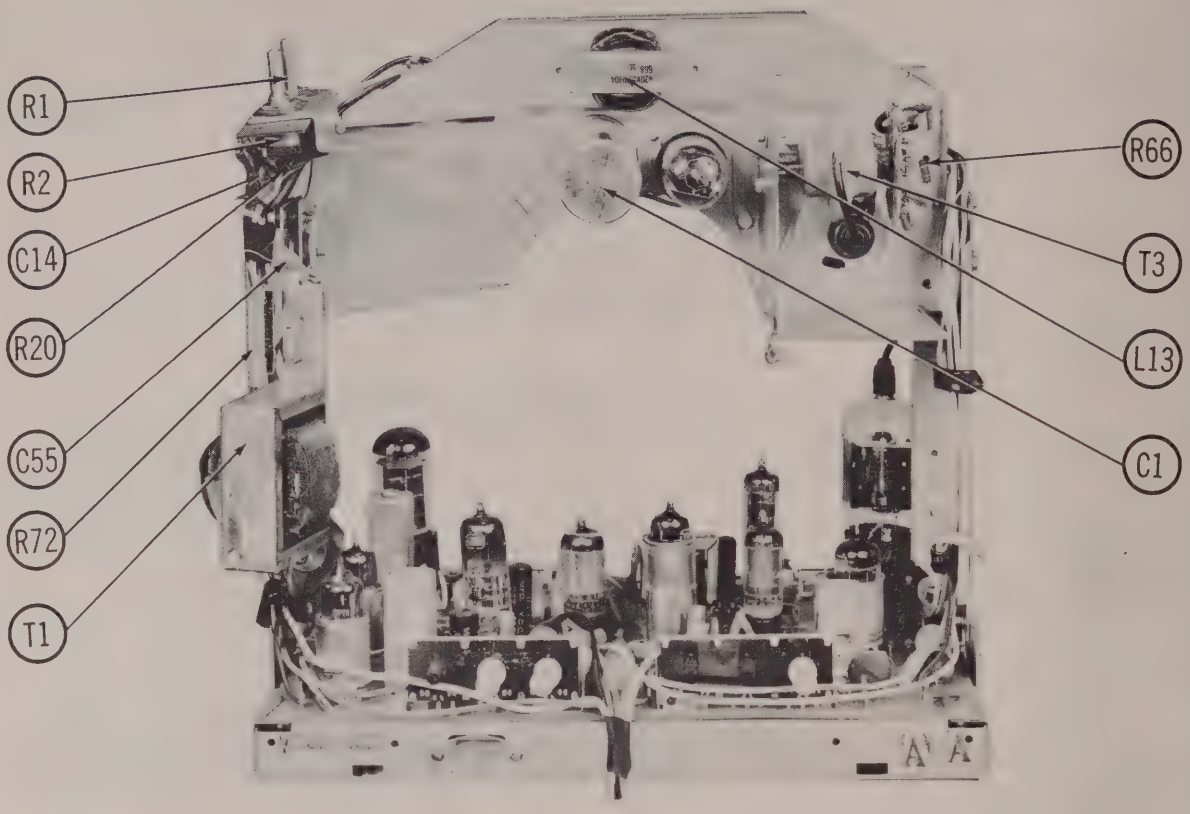
NAME	PART NO.	DESCRIPTION
Mask	810V012H01	
Knob	550V032H09	VHF Channel Selector
Knob	550V031H06	VHF Fine Tuning
Knob	550V050H03	UHF Tuning
Knob	550V054H03	On-Off-Volume
Knob	550V054H04	Contrast
Dial	550V029H06	UHF
Handle	558V093H03	

WIRING DATA

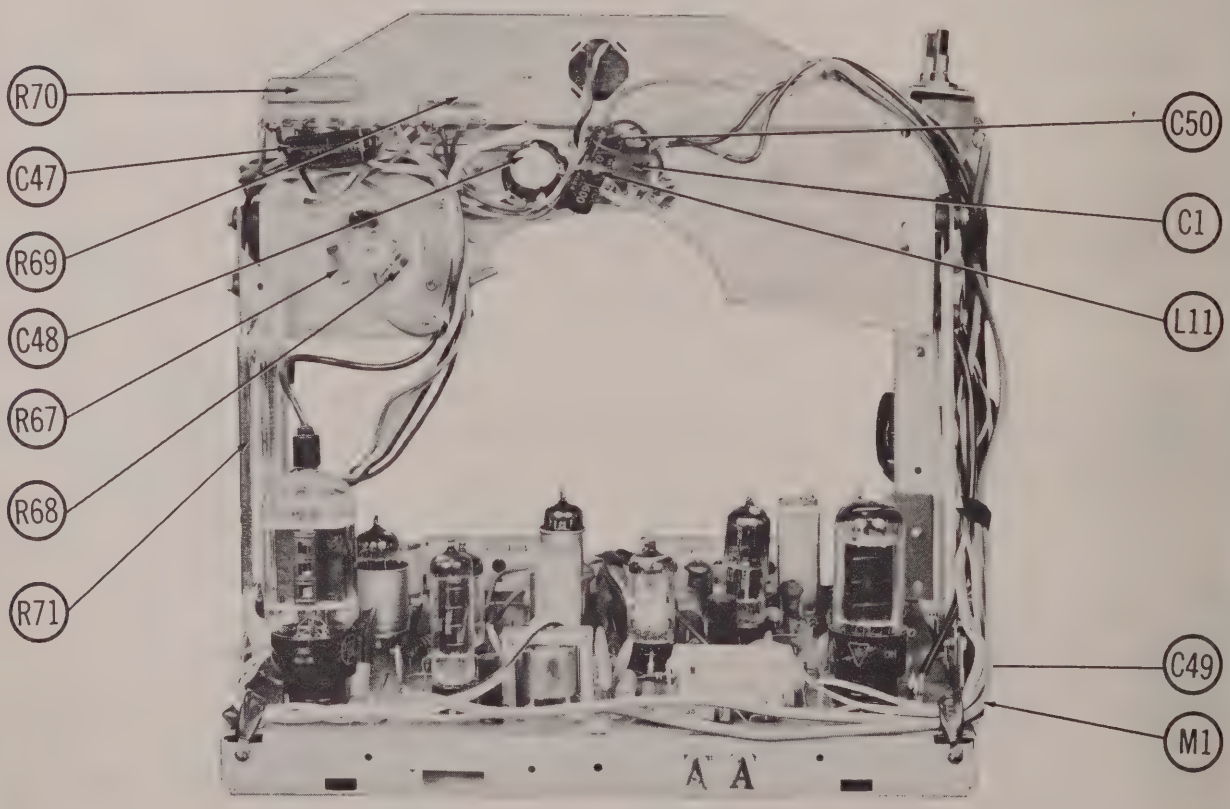
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8495 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AIRLINE MODELS GTM-4201A, GTM-4301A

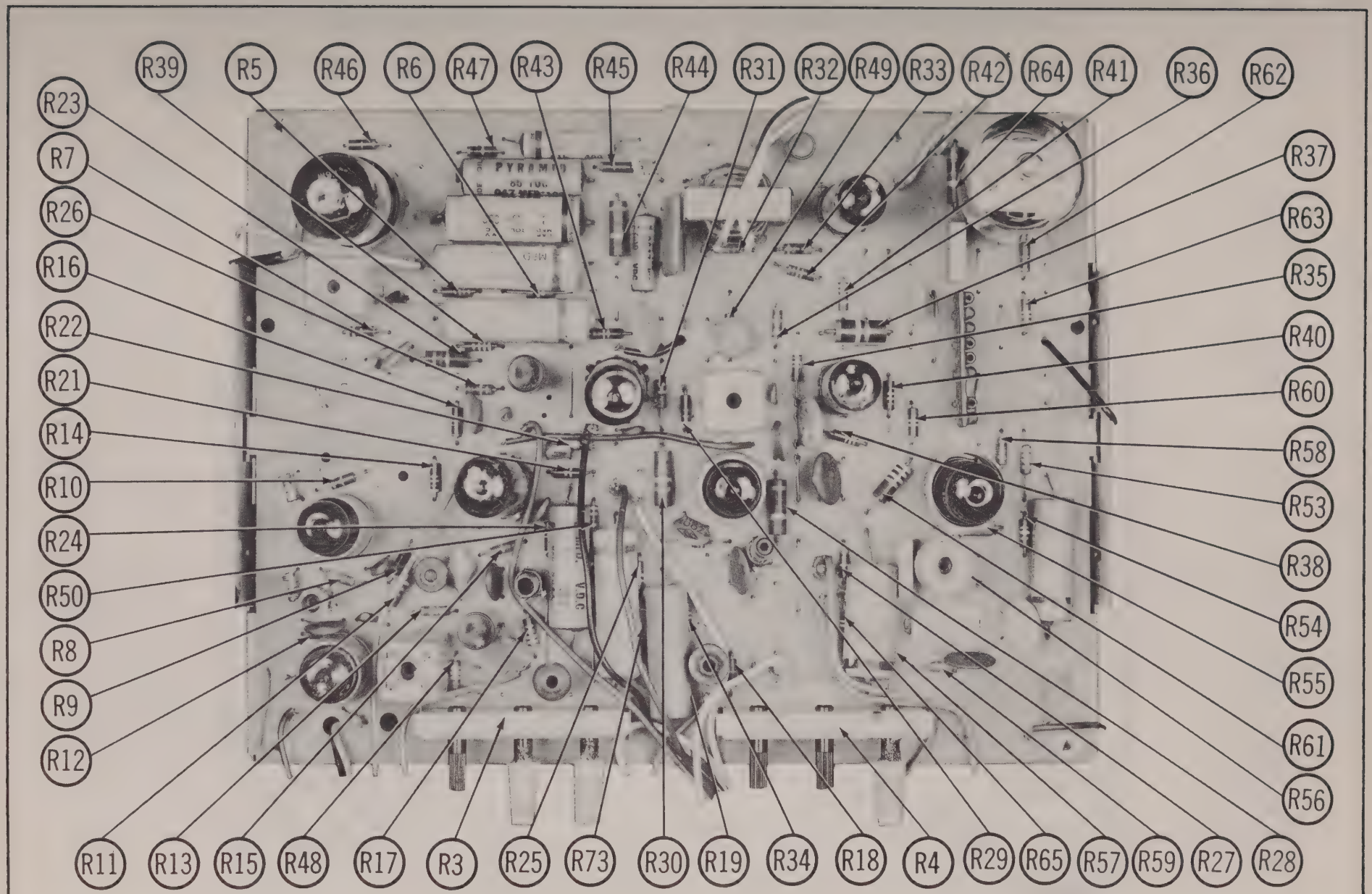
FOLDER 1



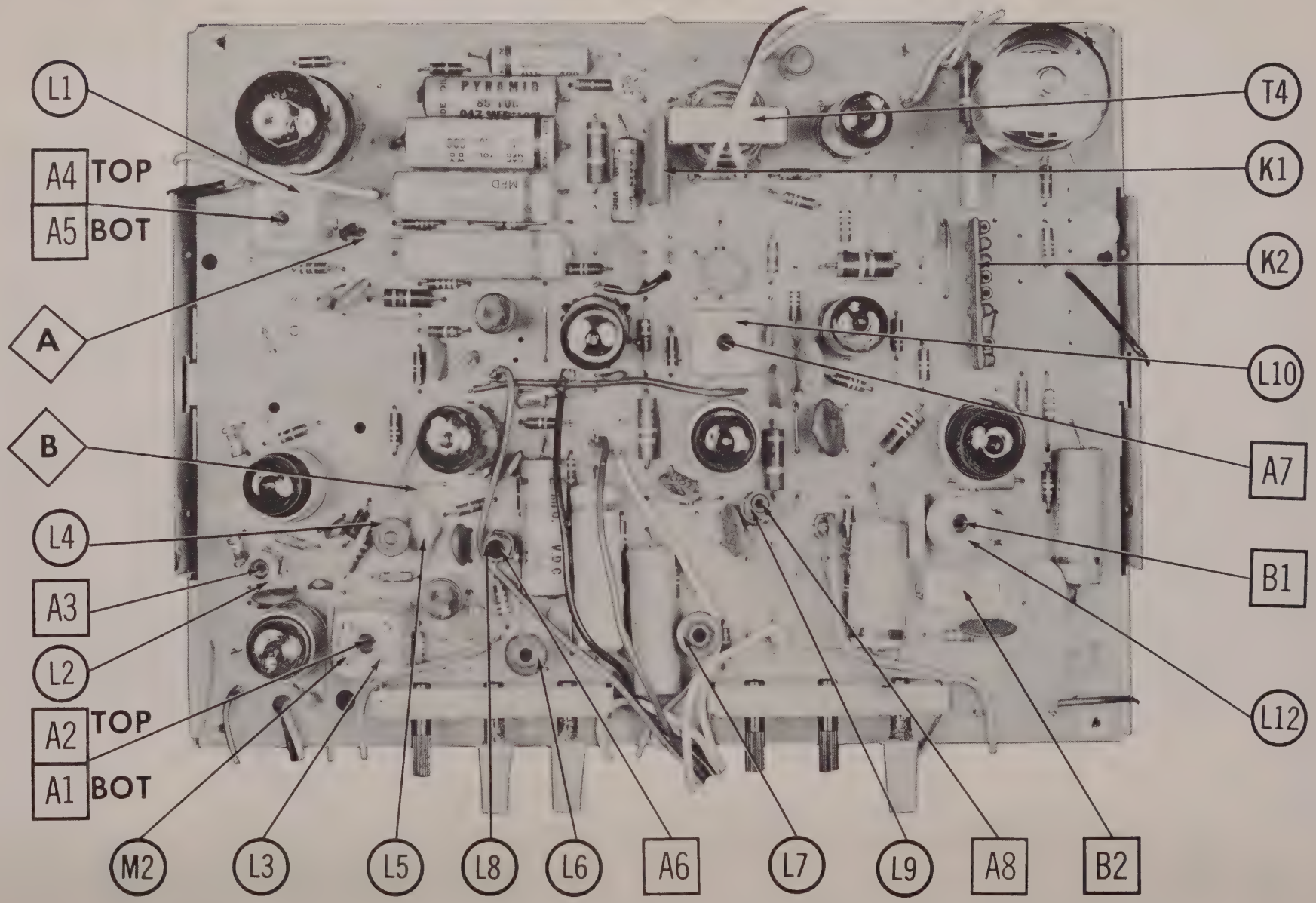
CHASSIS-REAR VIEW



CHASSIS-FRONT VIEW



PRINTED BOARD-RESISTOR IDENTIFICATION



PRINTED BOARD-INDUCTOR & ALIGNMENT IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

470V053H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	120		13L8Z121K		DTZ-120				5
C202	30		13M320U300NH-Z3						
C203	15		13L8GP150K	NPO-DI 15	DTZ-15	C10Q15C		5TCC-Q15	10
C204	15		18L8GP150J						5
C205	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C206	2-10		31B-902-09						
C207	800		13M320EA801Z-Z3						
C208	2-6		31B-902-01						
C209	47		13M130U470J-01						
C210	800		13M320EA801Z-Z3						
C211	800		13M320EA801Z-Z3						
C212	51		13L10T510K						N470
C213	2-6		31B-902-01						
C214	1000		31JA-024	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C215	1		13D111-35						10
C216	10		13L8T100D						N470
C217	10		13L8Q100F						N1400
C218	1.8								1
C219	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C220	60		13M320Q600J-Z3						
C221	800		13M320EA801Z-Z3						
C222	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C223	800		13M320EA801Z-Z3						
C224	680			BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	2

NOTE: Part numbers listed above are "Standard Coil" part numbers.
1 Not used in some versions.
2 Not used in Tuner #470V053H01.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PART No.	NOTES
R201	4700Ω			
R202	470Ω			Note 1
R203	2700Ω	1		
R204	3300Ω			
R205	10K			

ITEM No.	RATING OHMS	RATING WATT	PART No.	NOTES
R206	220K			
R207	10K			
R208	1000Ω			
R209	10K			
R210	5600Ω			

Note 1. Tuner #470V053H01 uses 1000Ω in this application.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3066	
L202	IF Trap Coil	34A-763	
L203	IF Trap Coil	34A-762	

ITEM No.	USE	PART No.	NOTES
L204	Mixer Plate	31UA-580	
L205	RF Choke	25A-211-01	

Note: Part numbers listed above are "Standard Coil" part numbers.

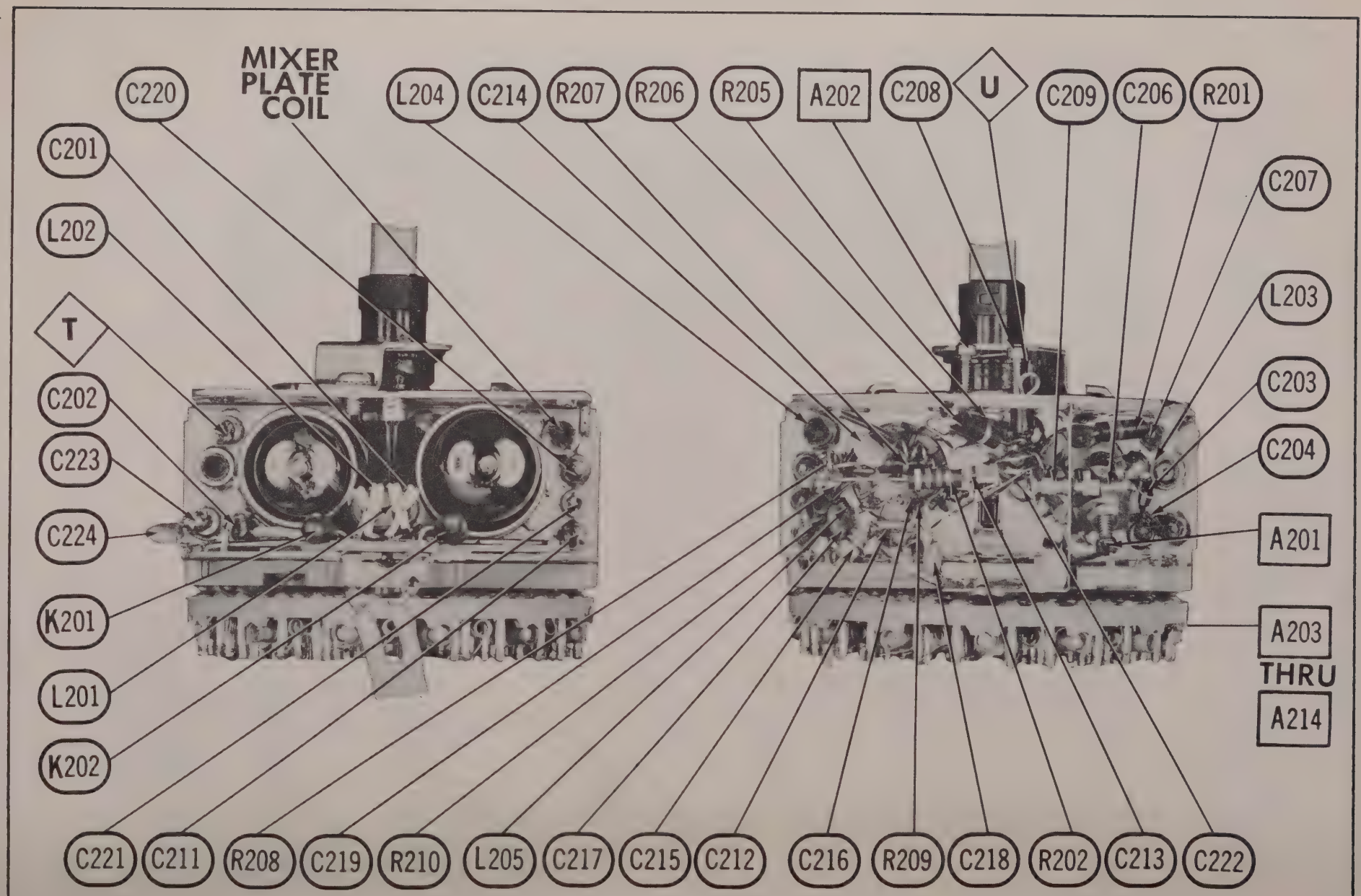
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No	REPLACEMENT DATA	
K201	Antenna Isolation	330mmf. 220K		Centralab	RC-431
K202	Antenna Isolation	330mmf. 220K		Centralab	RC-431

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
V201	UHF Rear Cover	31J-010-051	

NOTE: Part number listed above is "Standard Coil" part number.



VHF TUNER 470V053H01

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	480K	47Ω	5.5Ω	4.5Ω	†650Ω	†650Ω	0Ω		
V2	3DK6	.1Ω	150Ω	4.5Ω	4Ω	†650Ω	†650Ω	0Ω		
V3	6BH8	100Ω	10K	†5700	9.5Ω	8Ω	150Ω	1meg	†180Ω	†4000Ω
V4	3BN6	•330Ω	.4Ω	10Ω	9.5Ω	†8300Ω	7.7Ω	†560K		
V5	12C5/ 12CU5	82Ω	0Ω	11Ω	13.5Ω	0Ω	†1120	†850Ω		
V6	3CS6	27K	0Ω	10Ω	11Ω	†28K	†15K	2meg		
V7	6CN7	0Ω	1.7meg	680K	0Ω	0Ω	0Ω	•950K	•‡6meg	1Ω
V8	12W6GT	NC	8Ω	†130Ω	†180Ω	•1.2meg	NC	5.5Ω	0Ω	
V9	7AU7	†170K	•230K	1500Ω	16Ω	16Ω	†39K	2.3meg	1500Ω	15Ω
V10	12DQ6A	NC	13.5Ω	NC	†100Ω	470K	NC	15Ω	.6Ω	TOP CAP ‡12Ω
V11	12D4GT	NC	NC	¶260K	NC	†.9Ω	NC	16Ω	19Ω	
V12	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡712Ω
V13	17CFP4	1Ω	100K	Pin 6 †180Ω	Pin 10 ‡1meg	Pin 11 •240K	Pin 12 2.5Ω			
V201	2BN4	0Ω	500K	4Ω	3.5Ω	†1100Ω	0Ω	500K		
V202	5CG8	10K	†5700Ω	0Ω	2.5Ω	3.5Ω	†1100Ω	†10K	0Ω	230K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

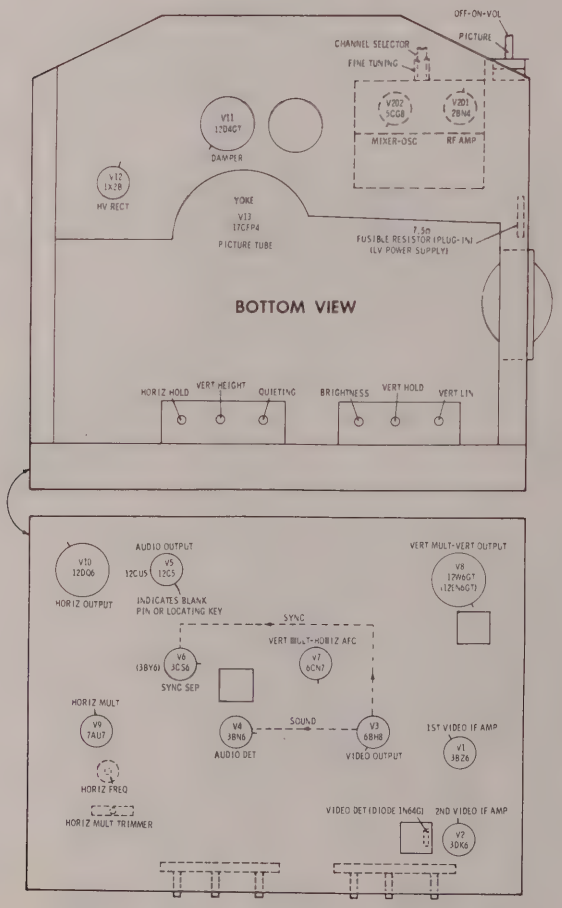
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 135V SOURCE.

‡ MEASURED FROM PIN 3 OF V11.

NC NO CONNECTION.



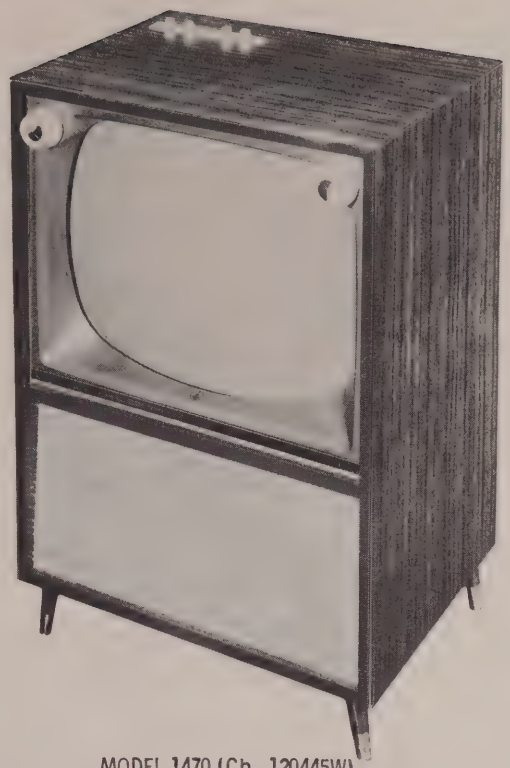
TUBE PLACEMENT CHART

PHOTOFACT* Folder
*TRADE MARK
with CIRCUITRACE*
*TRADE MARK

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 front and 4 top push-on type control knobs.
2. Remove 7 wood screws holding rear cover. Remove rear cover.
3. Remove picture tube socket, 2 interchassis plugs, high voltage lead and speaker leads.
4. Remove yoke clamp and yoke from picture tube.
5. Remove horizontally mounted power chassis by removing 6 (bottom) chassis metal screws.
6. Remove power chassis.
7. Remove 2 metal screws holding top control knob metal trim.
8. Remove 1 wood screw holding picture tube cathode lead to side of cabinet.
9. Remove 2 metal screws holding printed circuit chassis to mounting bracket at bottom and 2 wood screws at top.
10. Remove 2 phillips screws holding antenna terminal board to cabinet.
11. Remove 2 metal and 1 wood screw holding tuner mounting bracket.
12. Lay printed circuit chassis and tuner in bottom of cabinet and remove 2 metal screws holding On-Off-Volume control bracket (inside right front).
13. Remove printed circuit chassis and tuner from cabinet.



MODEL 1470 (Ch. 120445W)

TRADE NAME	Emerson	MODELS	CHASSIS	MODELS	CHASSIS
		1466	120434N	1467	120435Y
		1466	120434W	1470	120445W
		1467	120435P	1471	120446Y
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th. & Coles Sts., Jersey City 2, N.J.				
TYPE SET	Television Receiver				
TUBES	Seventeen				
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 170 Watts, 1.64 Amp. @ 117 Volts AC				
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)				

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. One slug for channel 13 adjustment is located at 8 o'clock, and should be adjusted first. The channels 2-12 adjustments are located at 4 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type control knobs from the front.
Remove 5 wood screws holding metal trim at top edge of safety glass. Tilt glass out at the top and lift to remove.

SPECIAL ADJUSTMENTS

A. Local-Distance
Observe the picture and advance the Local-Distance control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.
B. Focus
No provision is made to vary the focus on this receiver.
C. Width
Width may be adjusted by means of a jumper across R80 located directly in front of the power transformer.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.)

CENTERING

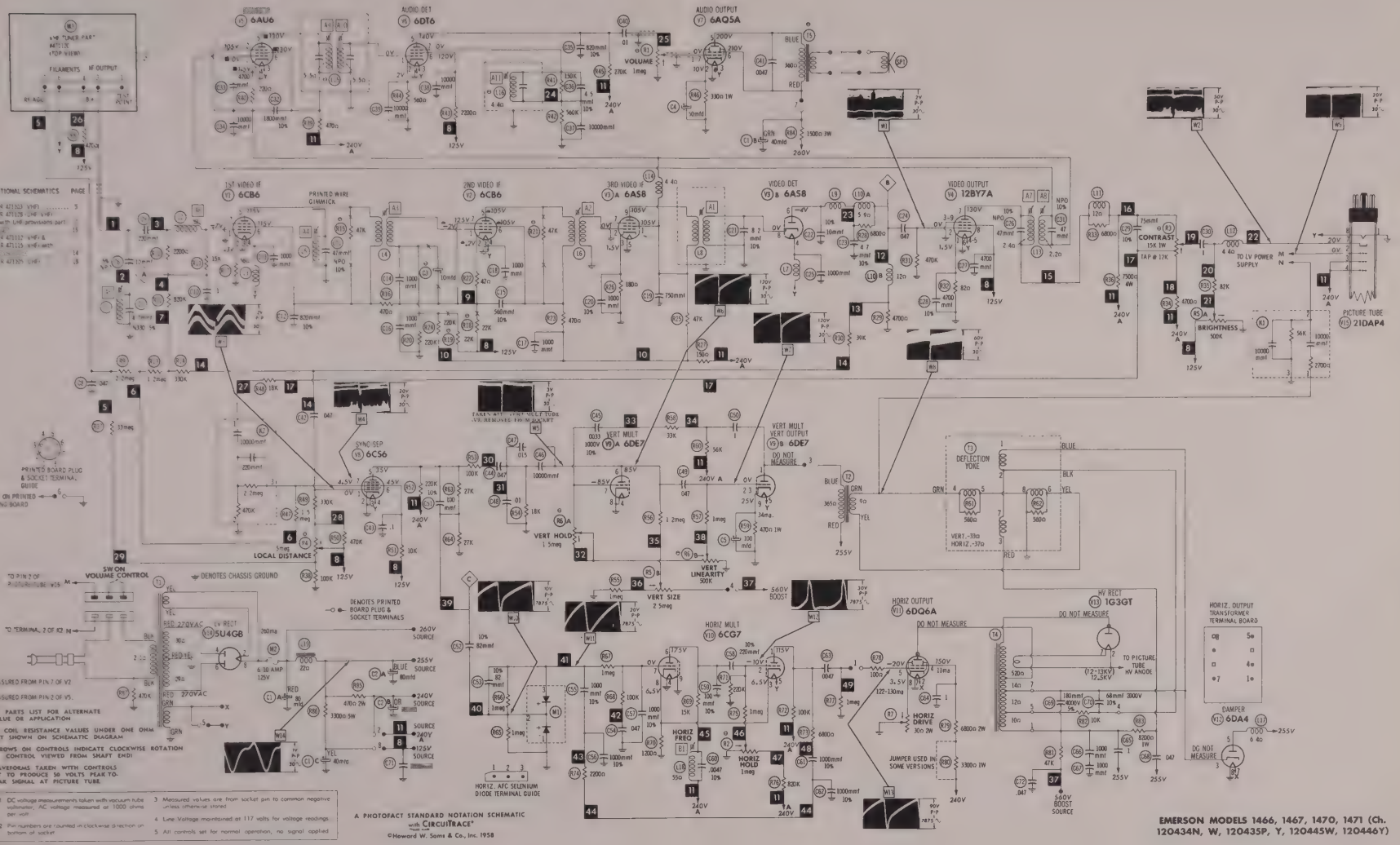
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H834

EMERSON MODELS 1466, 1467, 1470, 1471 (Ch. 120434N, W, 120435P, Y, 120445W, 120446Y)
SET 420 FOLDER 2


EMERSON MODELS 1466, 1467, 1470, 1471 (Ch. 120434N, W, 120435P, Y, 120445W, 120446Y)
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®
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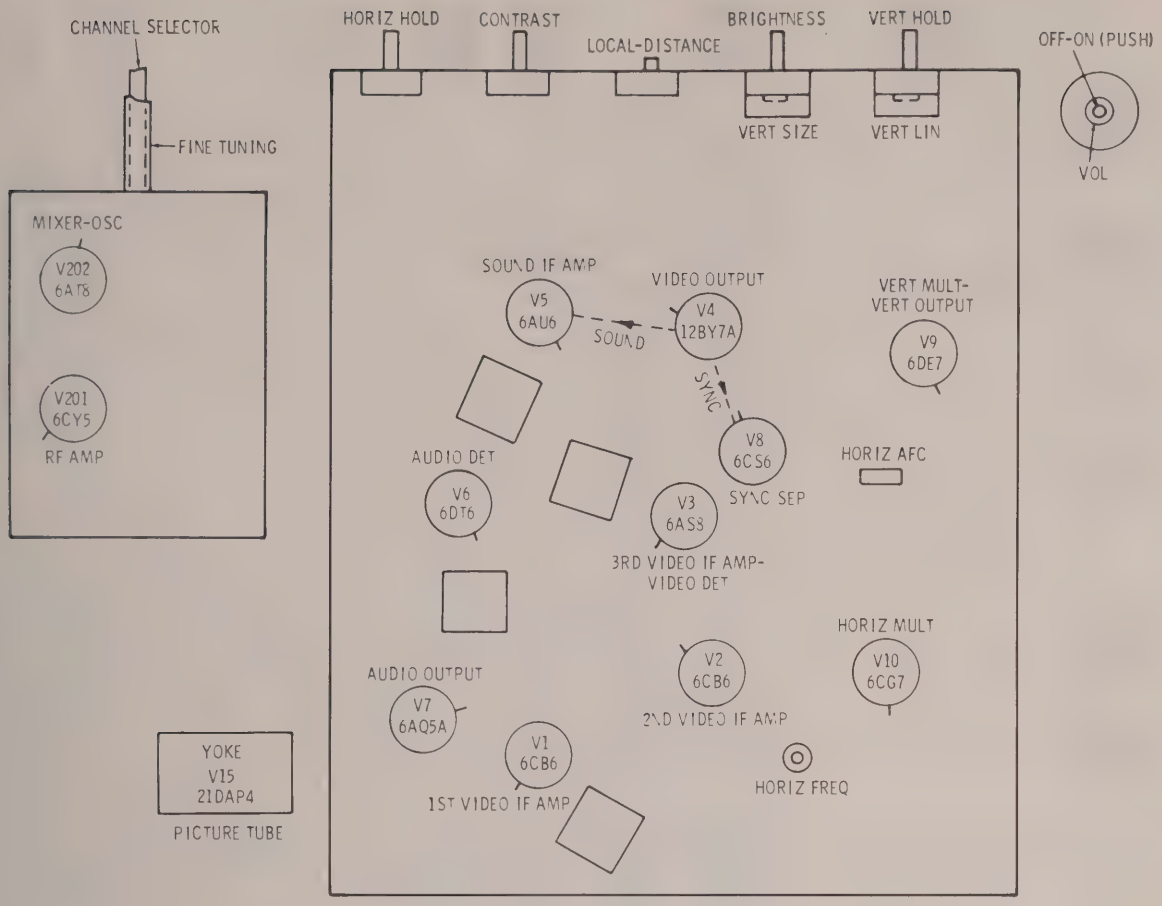
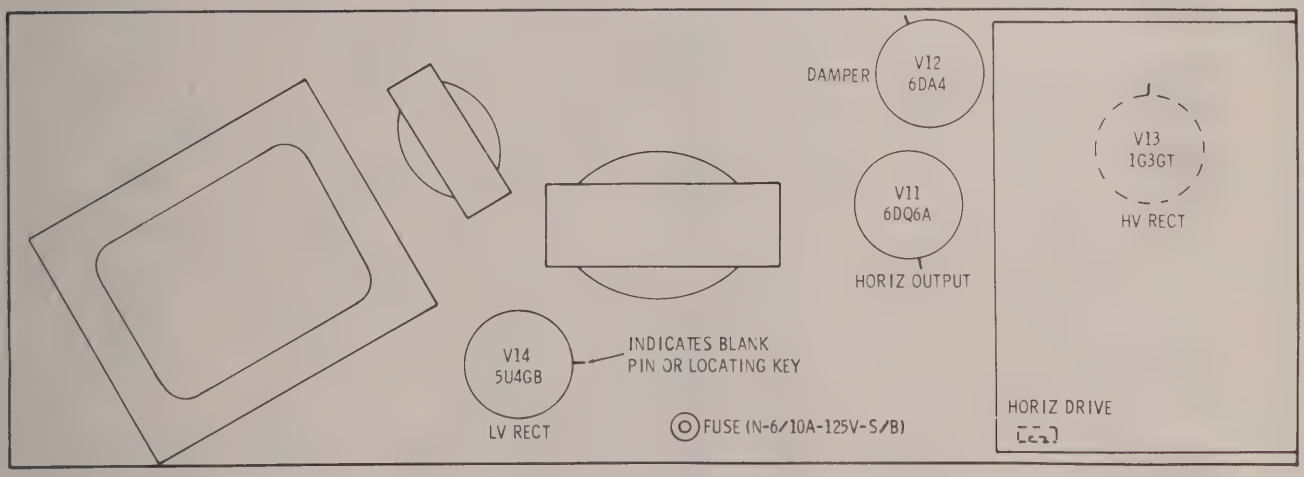
TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

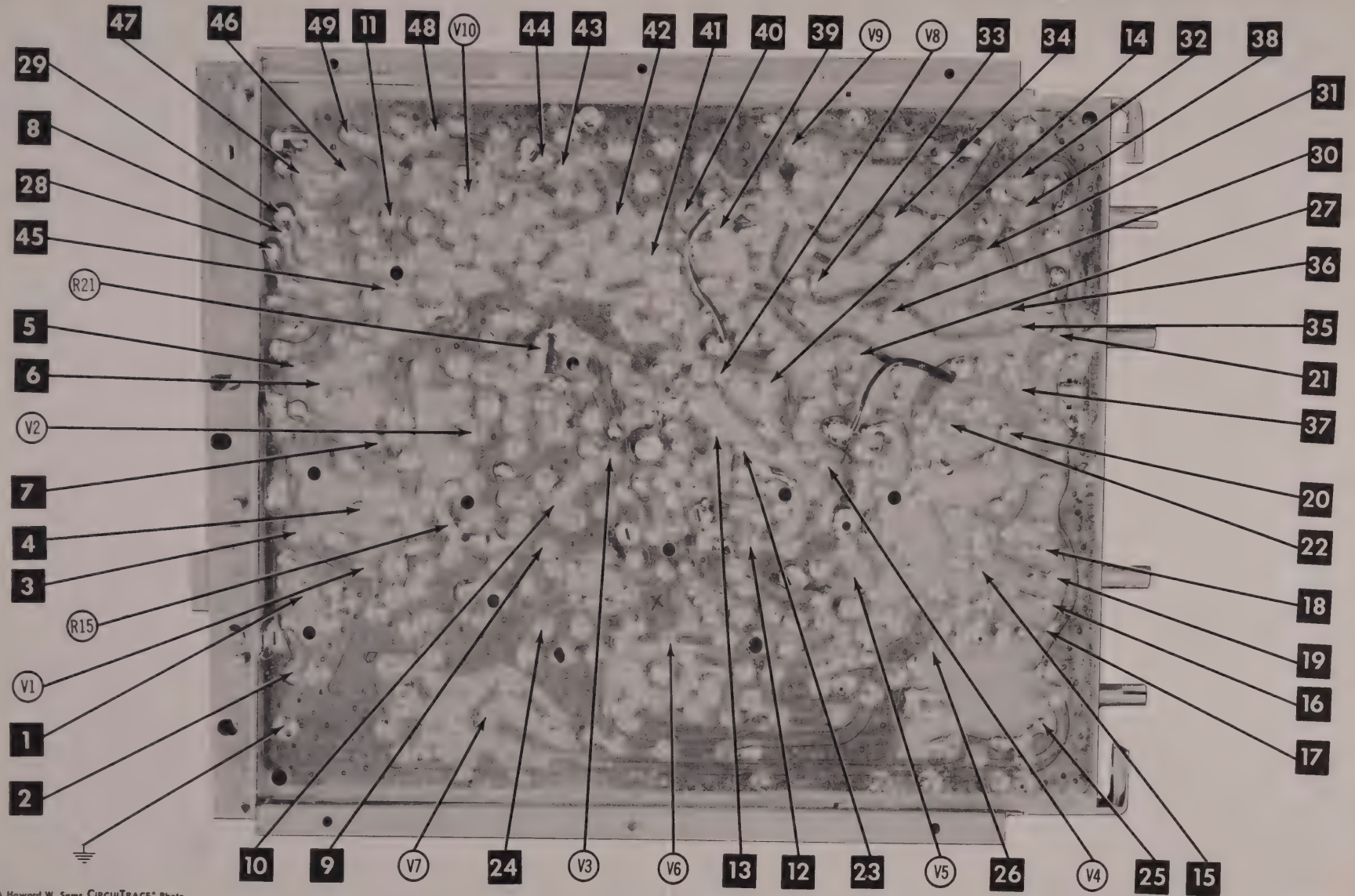
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (M2), V14

SWEEP FAILURE
No raster, has sound Rectifier (M1), V10, V11, V12, V13, V15
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7

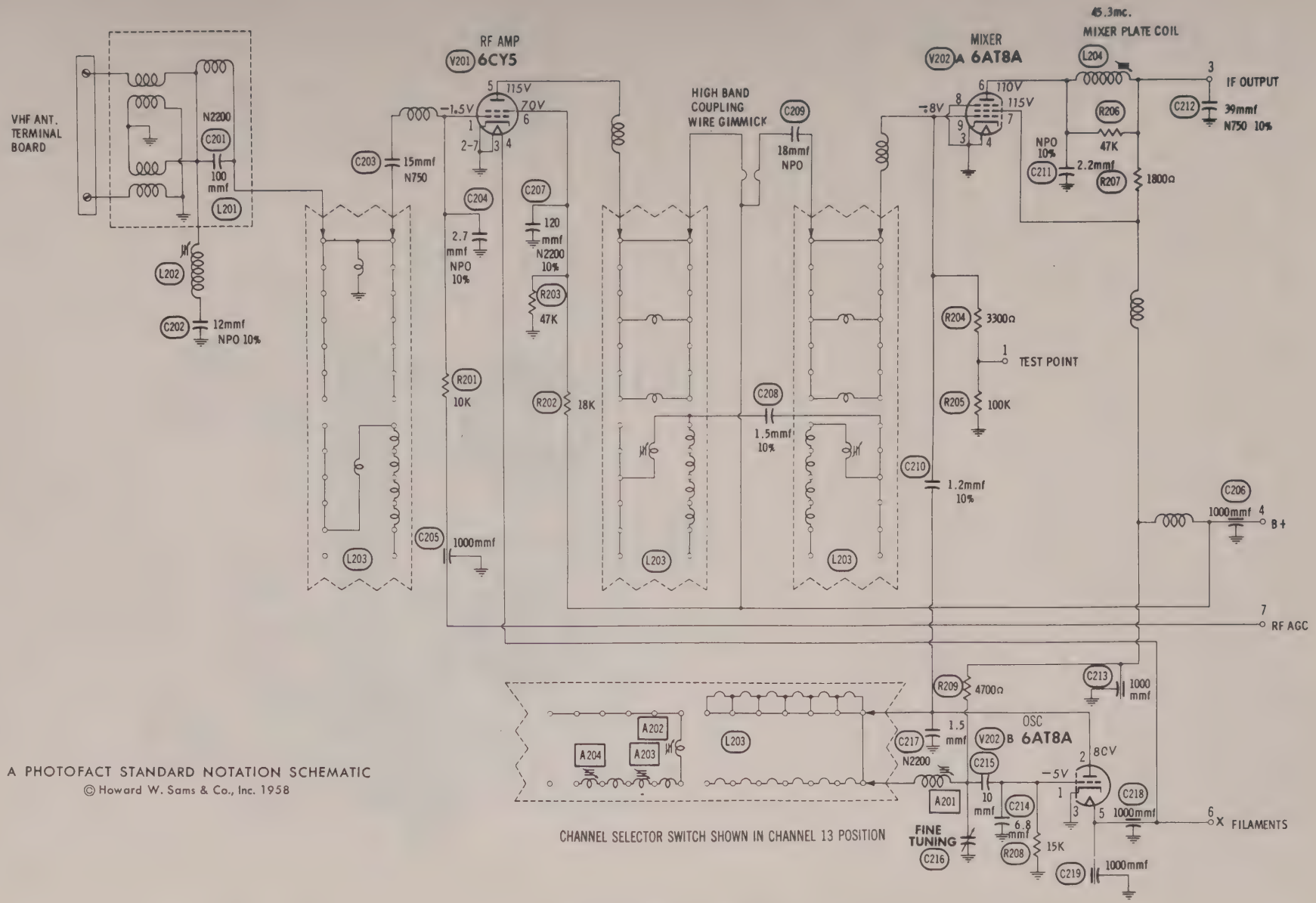
SYNC FAILURE
No vert. sync V8
No horiz. sync V8, M1
No vert. or horiz. sync V8



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 471103, 471120

EMERSON MODELS 1466, 1467, 1470, 1471 (Ch. 120434N, W, 120435P, Y, 120445W, 120446Y)
FOLDER 2

TUNER ALIGNMENT INSTRUCTIONS

ALIGNMENT FOR TUNERS 471103 & 471120

VHF OSCILLATOR ALIGNMENT

Channel 13 oscillator adjustment slug (A201)is also used for adjusting the other high band (12 thru 7) channels. Channel 6 oscillator adjustment slug (A202) is also adjusted for channel 5. Channel 4 oscillator adjustment (A203) is also adjusted for channel 3. Channel 2 oscillator slug (A204) is used only for channel 2.
Turn the set on and tune in the highest high band channel and adjust control for normal operation. Set Fine Tuning to the center of its range . Adjust A201 for best picture and sound. Switch to next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft for best picture and sound.
Switch Channel Selector to the highest low band channel (6 thru 2) operating in the area. Adjust proper slug for best picture and sound. If channel 5 or 3 need adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

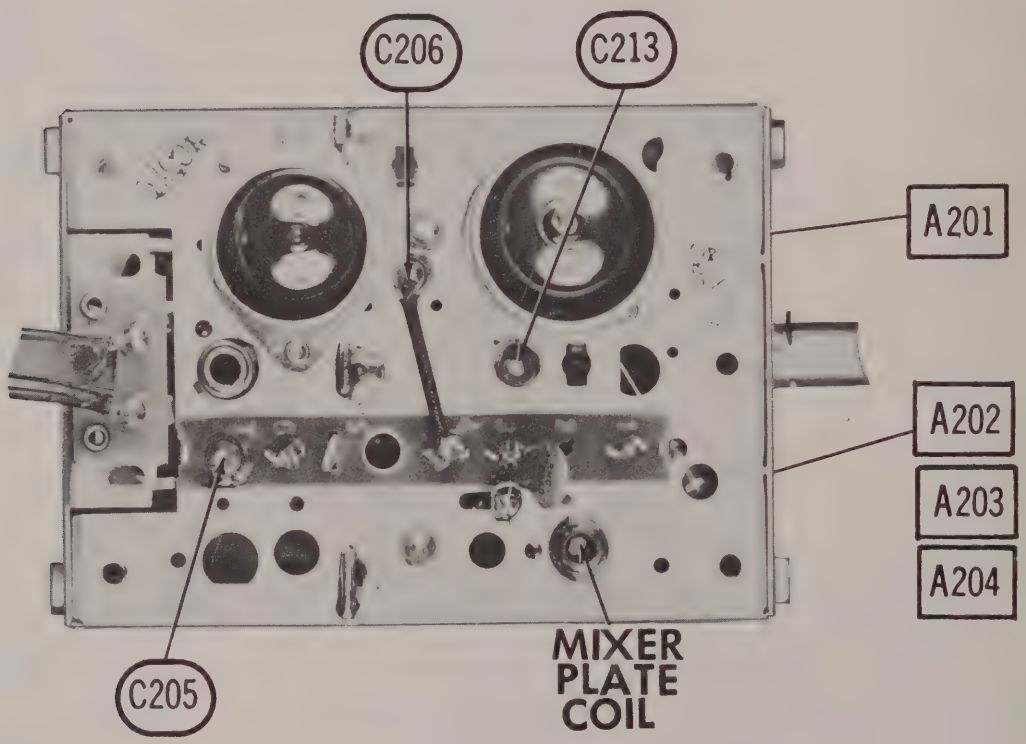
ALIGNMENT FOR TUNERS #471112 & 471115

OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time, thru a hole in the right side of tuner rear cover as viewed from rear, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

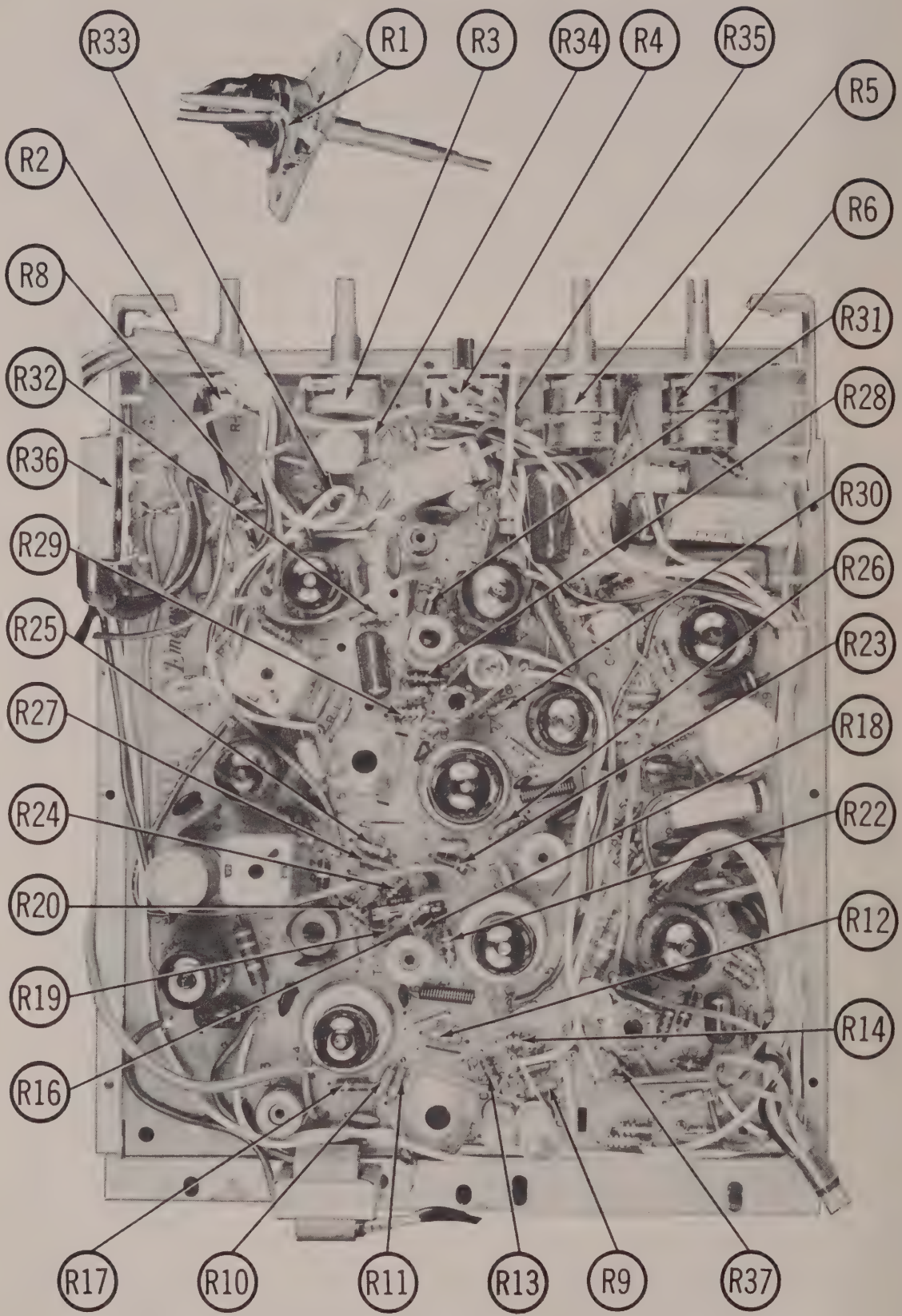
RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

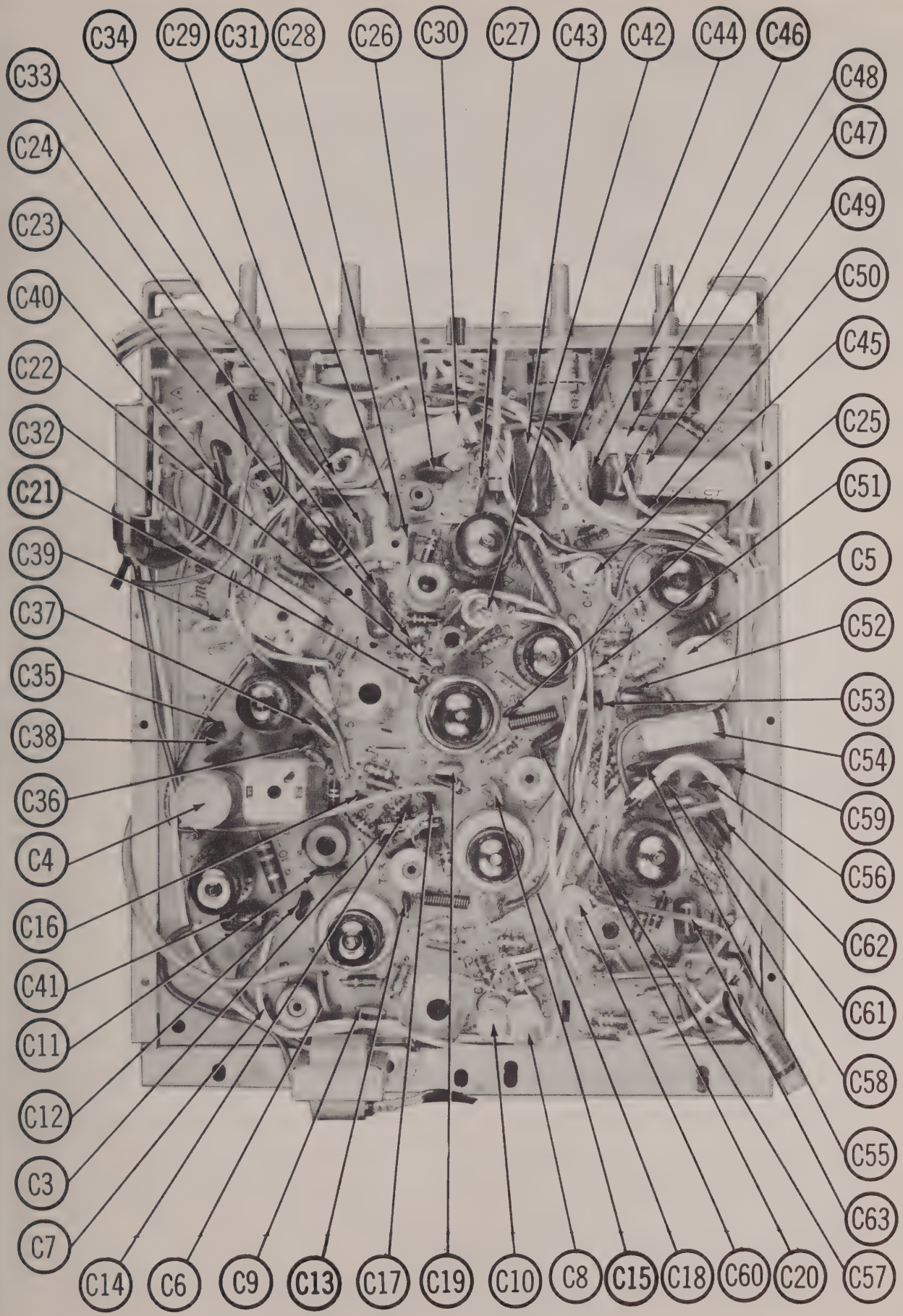


TUNER 471103—TOP VIEW

EMERSON MODELS 1466, 1467, 1470, 1471 (Ch. 120434N,
W, 120435P, Y, 120445W, 120446Y)
VHF W/UHF PROVISIONS PART OF TUNER 471128 (962285)
FOLDER 2
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1958
3 IF OUTPUT
4 B+
7 RF AGC
6 X FILAMENTS
MIXER PLATE COIL
MIXER A 6AT8
RF AMP 6CY5
OSC B 6AT8
TEST POINT
HIGH BAND COUPLING WIRE GIMMICK
FINE TUNING
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF TUNER B+
UHF IF INPUT
VHF ANT. TERMINAL BOARD
A201
A202
A203
A204
1000Ω
1000mmf
47K
2.2mmf
10K
100K
150K
1800Ω
560Ω
18mmf
800 mmf
47K
18K
1000 mmf
2.4mmf
22mmf N470
100mmf N2200 5%
10mmf
1.5mmf ± 5% N2200
3300Ω 1W
15K
15mmf 5%
6.8 mmf N750



RESISTOR IDENTIFICATION (Rl THRU R 37)



CAPACITOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools for all slugs (12) ..... General Cement #8282, 8606, 8606L or 9295.
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Set the "Local-Distance" fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield . Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	44.25MC	Any non-interfering channel	USE VTVM. DC probe to point (B). Common to chassis. (Across Video Det. load)	A1	Adjust for maximum deflection.
2.	"	"	"	45.3MC	"	"	A2	"
3.	"	"	"	42.6MC	"	"	A3	"
4.	"	"	"	41.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	"	47.25MC	"	"	A5	"
6.	"	"	"	45.3MC	"	"	A6	"
7.	"	"	"	45.3MC	"	"	Mixer Plate Coil	Adjust for maximum deflection.
8.	"	"	"	43.1MC	"	"	A6	Readjust for maximum deflection.
9.	"	"	45.0MC (10MC Swp)	45.75MC 47.25MC	"	USE SCOPE. Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary, repeat steps 1 thru 8.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and adjust the Fine Tuning so that a 4.5MC beat pattern is visible in the picture. Adjust A7 for MINIMUM beat interference in the picture.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust A8, A9 and A10 for maximum volume. Adjust A11 for maximum undistorted sound. If two peaks are obtained, use the one with the slug nearest the circuit board. With the antenna loosely coupled to the receiver to provide a weak signal, retouch A8, A9 and A10 for maximum undistorted sound.
Check sound on all available channels and if necessary, repeat sound alignment.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

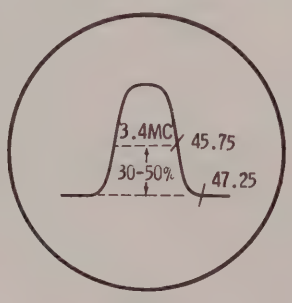
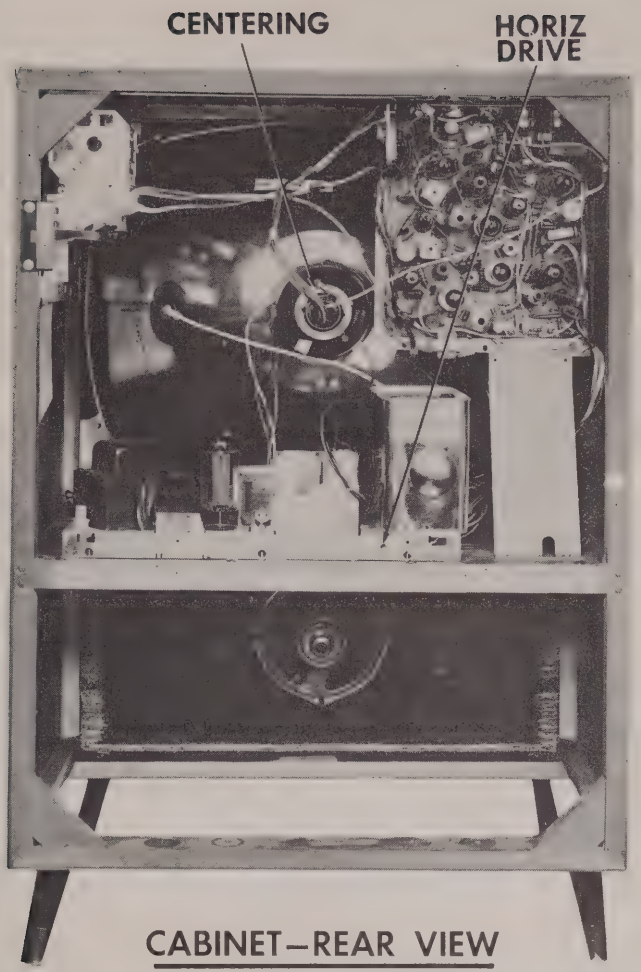


FIG. 1



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV signal and set the "Local-Distance" fully counterclockwise.

Connect a clip lead across the Horizontal Frequency coil (L17). Connect another clip lead from point Ⓒ to chassis.

Adjust the Horizontal Hold until the picture synchronizes horizontally. (In most cases the picture will appear to float back and forth across the screen.)

Remove the clip lead from L17. Adjust the Horizontal Frequency slug (B1) until the picture again synchronizes horizontally.

Remove the clip lead from point Ⓒ and chassis. The picture should then lock in solid.

Set the Horizontal Drive as far counterclockwise as possible without the presence of a vertical white line (drive line) or compression near the center of the raster.

Insufficient width may be corrected by connecting a jumper across R75.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6CB6	
V2	2nd. Video IF Amp.	6CB6	
V3	3rd. Video IF Amp. - Video Det.	6AS8	
V4	Video Output	1EB1YA	
V5	Sound IF Amp.	6AU8	
V6	Audio Det.	6DT8	
V7	Audio Output	6AQ8A	
V8	Sync Sep.	6C86	
V9	Vert. Mult.-Vert. Output	6DE7	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	6DQ8A	
V12	Damper	6DA4	
V13	HV Rect.	1G3GT	
V14	LV Rect.	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	EMERSON PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	21DAP4	21DEP4 ①	21DAP4 ②	21DAP4 ③	① Aluminized" ② Silverama" ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	EMERSON PART No	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No
C1A	80	300	935437		BBRT0185				R2730 *
B	40	300			BR4035				
C	40	300							
C2A	80	300	935438	PR3-030	BBRT0185			D-176	TVA-3713
B	40	300							
C9	10	25	935443 ①	PR25EV10	BBR10-25	TT50X10	TD-10-25	MQ-0510	TVA-1304
C4	50	25	935467	PR25EV50	BBR50-25	TC250	TD-50-25	MT-0250	TVA-1306
C5	100	50	935442	PR25EV100	BR1005	TC350	TD-100-50	MTH-5010	TVA-1310

① Not used in early versions.
* Not normally in distributors stock. Available through distributors on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	EMERSON PART No	AEROVOX PART No.	CENTRALAB PART No	CORNELL DUBILIER PART No	MALLORY PART No	SPRAGUE PART No	
C6	10		926804X		DTN-10				NPO 5%
C7	4.7		926800X						N330 5%
C8	.047	200	923127	P288N-047		BC284TJ	ACE6147	2SE-S47	
C9	220		926902X	BPD-00022	DD-221	L20T22	UC-3322	5GA-T22	
C10	.1	200	923127	P288N-1		BC2PLT	ACE6Q1	2SE-P10	
C11	47		926890X	NPO-D547	DTN-47	C10Q47C		5TCC-Q47	NPO 10%
C12	330		926904X			1R5T32		MS-332	10%
C13	1000		926933X	BPD-001	DD-103	BYA5D1	DC521	5HK-D1	
C14	1000		926933X	BPD-001	DD-103	BYA5D1	DC521	5HK-D1	
C15	680		926906X		D5-561	1R5T56		MS-356	10%
C16	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C17	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C18	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C19	750		926930X	DI-00075	D5-751	1R5T75	UC-4375	MS-375	
C20	1000		926811X			1R5D1	MCB355	MS-2I	10%
C21	6.2		926975X			C10Y32C			10%
C22	10		926892X	NPO-DI 10	DTN-10	C10Q1	ZT-541	5TCC-Q1	10%
C23	4.7		926974X	NPO-DI 4.7	DTN-4R7	C10Y47C	ZT-2547	5TCCB-Y47	10%
C24	.047	300	921354	P288N-047	DF-503	CUB2S47	GEM-4147	2SE-S47	
C25	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C26	47		926890X	NPO-DI 47	DTN-47	C10Q47C		5TCC-Q47	NPO 10%
C27	4700		926923X	BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C28	4700		926923X	BPD-0047	DD-472	1R5D47		5GA-D47	10%
C29	75		926978X			L10Q75		MS-475	10%
C30	.1	400	921515	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C31	47		926890X	NPO-DI 47	DTN-47	C10Q47C		5TCC-Q47	NPO 10%
C32	1800		926987X			1R5I8		MS-218	10%
C33	4700		926923X	BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C34	10000		926934X	BPD-01	DD-103	BYA5S1	DCS11	5HK-S1	
C35	330		926904X			1R5T32		MS-332	10%
C36	5.5		926992						5%
C37	10000		926955X	BPD-01	DD-103	BYA5S1	DCS11	5HK-S1	
C38	10000		926934X	BPD-01	DD-103	BYA5S1	DCS11	5HK-S1	
C39	10000		926955X	BPD-01	DD-103	BYA5S1	DCS11	5HK-S1	
C40	.01	400	934434	P488N-01	D5-103	CUB4S1	GEM-411	4TM-S1	
C41	.0047	600	921753	P668N-0047	D5-472	CUB6D47	GEM-6347	6TM-D47	
C42	.047	400	923128	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C43	.1	400	921515	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C44	.047	400	921564	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C45	.0033	1000	923123						10%
C46	10000		926955X	BPD-01	DD-103	BYA5S1	DCS11	5HK-S1	
C47	.015	400	921520	P488N-015	DD5-153	CUB5S15	GEM-4115	4TM-S15	
C48	.01	400	921514	P488N-01	D5-103	CUB4S1	GEM-411	4TM-S1	
C49	.047	600	921554	P668N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C50	.1	600	921715	P668N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C51	100		926900X			D10-101	L10T1	ZT-531	MS-3I	10%
C52	82		926977X			D5-820	L10Q82		MS-482	10%
C53	82		926977X			D5-820	L10Q82		MS-482	10%
C54	.047	400	921554	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C55	1000		926811X			1R5D1	MCB355	MS-2I	10%
C56	1000		926811X			1R5D1	MCB355	MS-2I	10%
C57	1000		926811			1R5D1	MCB355	MS-2I	10%
C58	220		925042	1469-00022	D5-221	5R5T22		MS-322	10%
C59	100		925039	1469-0001	D5-101	5R5T1	MCB330	MS-3I	10%
C60	.0047	600	933135				GEM-16347		10%
C61	1000		926811X			1R5D1	MCB355	MS-2I	10%
C62	1000		926811 X			1R5D1	MCB355	MS-2I	10%
C63	.0047	600	921553	P468N-0047	D5-472	CUB6D47	GEM-6347	6TM-D47	
C64	.1	400	924515	P468N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C65	.1	600	924715	P668N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C66	1000		926933X	BPD-001	DD-103	BYA5D1	DC521	5HK-D1	
C67	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C68	.047	600	924754	P668N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C69	180	4000	932695						5%
C70	68	2000	932836						10%
C71	1000		926933X	BPD-001	DD-102	BYA5D1	DC521	5HK-D1	
C72	.047	600	934754	P668N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	390559				FA16L	Volume & Push Type Sw ①
R2A	1meg	½	390558A	F1-51			OS1187	Horiz. Hold ②
B	Shaft			Not Req.				
R3	15K	1	390567					Contrast, Tap ③ 15K ④
R4A	5meg	½	390560	AB-57	B47-5meg-S	QH-141	PTA56L	Local-Distance ②
B	Shaft			AE-19	Not Req.	TQ	Not Req.	
R5A	500K	½	390547A	F1-40				Brightness
B	2.5meg	½		R3-76			a (UE3884	Vert. Size
R6A	1.5meg	½	390561A	F1-64			= (UE3885	Vert. Hold ④
B	500K			R2-40				Vert. Lin. ④
R7	30Ω	2(WW)	390544		39-50			Horiz. Drive

● "FTA-LOC" Equivalent: FA55L, OS1187, RU55L, 19437.
= "FTA-LOC" Equivalent: FA55L, OS1187, RU55L, 19437.
① Used in Ch. 130445W, 130446Y. Ch. 130434N, W, 130435P, Y used Part #390545.
② Used in Ch. 130445W, 130446Y. Ch. 130434N, W, 130435P, Y combined R2 and R4 in a dual control Part #390549.
③ Used in Ch. 130445W, 130446Y. Ch. 130434N, W, 130435P, Y used Part #390546.
④ A 1meg Vert. Hold and 1meg Vert. Lin. (Dual control) may be used in some versions. (Part #390548).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R8	470Ω		350413	
R9	2.2meg		341292	
R10	22000		340572	
R11	15K		340772	
R12	820K			
R13	1.2meg		341233	
R14	330K		341093	
R15	47K		340892	
R16	470Ω		350413	
R17	560		340892	
R18	22K			Note 1
R19	22K			Note 1
R20	220K		340852	
R21	47K		340892	
R22	47Ω		340172	
R23	470Ω		350413	
R24	220K		341052	
R25	47K		340892	
R26	180Ω		340312	
R27	150Ω		350352	
R28	6800Ω		340692	
R29	4700Ω		340652	
R30	39K		340852	
R31	470K		351132	
R32	82Ω		340332	
R33	6800Ω		340892	
R34	4700Ω		340652	
R35	82K		340952	
R36	7500Ω	4	397135	
R37	33meg		397126	
R38	100K		340972	
R39	470Ω		350412	
R40	220Ω		340332	
R41	150K		341012	
R42	560K		341152	
R43	3200Ω		340572	
R44	560Ω		340432	
R45	270K		341072	
R46	330Ω	1	370372	
R47	1.5meg		341252	

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R48	18K		340792	
R49	330K		341093	
R50	470K		351132	
R51	10K		340732	
R52	220K		341052	
R53	100K		340973	
R54	18K		340792	
R55	1meg		341213	
R56	1.2meg		341232	
R57	1meg		341213	
R58	33K		340852	
R59	470Ω	1	350412	
R60	56K		340912	
R61	560Ω		340432	
R62	560Ω		340432	
R63	27K		340832	
R64	27K		340832	
R65	1meg		341212	
R66	1meg		341212	
R67	1meg		341213	
R68	100K		340972	
R69	15K		370772	
R70	1200Ω		340512	
R71	220K		341052	
R72	100K		340972	
R73	6800Ω		340692	
R74	2200Ω		340572	
R75	1meg		340212	
R76	820K		341192	
R77	1meg		351213	
R78	100Ω		350252	
R79	6800Ω	2	780892	
R80	3300Ω	1	370812	
R81	47K		340892	
R82	10K		340732	
R83	8200Ω	1	370712	
R84	1500Ω	3	397117	
R85	470Ω	2	780412	
R86	3300Ω	5	390206	
R87	470K		351132	

Note 1. Not used in early production.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	47.25MC Trap	720317					
L3	1st. Video IF	720316					
L5	Fil. Choke	705031	19-1000	BC-561	4602		1.1 Microhenries
L4	2nd. Video IF	720318					
L5	41.25MC Trap	720315					
L6	3rd. Video IF	720318					
L7	Fil. Choke	705031	19-1000	BC-561	4602		1.1 Microhenries
L8	4th. Video IF	720318					
L9	RF Choke	705271	19-1003	BC-564	4608		4.6 Microhenries
L10A	Series Peaking Coil	705348					100 Microhenries
B	Shunt Peaking Coil						250 Microhenries
L11	Series Peaking Coil	705349					220 Microhenries
L13	RF Choke	705234	19-1004	BC-565	4610		6.8 Microhenries ①
L13A	4.5MC Trap	720397					②
B	Int. Sound IF						③
L14	RFChoke	705234	19-1004	BC-565	4610		6.8 Microhenries ①
L15	2nd. Sound IF	720322					②
L16	Quadrature Coil	720399					③
L17	RF Choke	705021	19-1005	BC-566	4613		10 Microhenries ④

② IRC Part #CLA. ③ Alternate Part #720337. ④ Alternate Part #720336. ④ IRC Part #CL-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L18	55Ω		716121						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000 °C.)	EMERSON PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L19	.250A	22Ω	.5 Hy.	737039			F-801 ①		26C44 ①	C-27X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	EMERSON PART No	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No.	Triad PART No
T1	117V ①1.64A	830VCT ②.360A	5V ③2.65A	730079		P-3060			26R47	
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ③7.7A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	738156					A-8142 ①		A-108X
T3A	Yoke-Horiz.(20MH)	708344						Y-53 ②	
B	(10°)-Vert.(31MH)								
	Rear Cover & Centering Device	708340							
	Yoke Clamp	597186 ③							
T4	Horiz. Output	738155							

① Drill new mounting hole(s).
② Remove 37mmf from terminals #2 & #7, remove jumper from terminals #1 & #3 , connect same as original, and use original rear cover and centering device.
③ Used with Ch. 130445W, 130446Y.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	EMERSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No.	
T5	5200Ω	3-4Ω	734178 ①	Z1000 ②	A-3026	AU-601 ②	A-3877 ②	24S48	S-6X	

① Alternate Part #734172. ② Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	EMERSON PART No	QUAM PART No.	
SP1	5"	PM	3-4Ω	180170	6A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON PART No	REPLACEMENT DATA	
K1	Vert. Blanking	10000mmf, 10000mmf, 56K, 2700Ω	923057	Centralab	PC-314
				Sprague	RS-3
K2	Sync Coupling	10000mmf, 220mmf, 470K, 2.2meg	923059		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	EMERSON PART No	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No	SARKES TARZIAN PART No.	
M1		817074	K1615		SD-91 ①		① Silicon Type (2 Used)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	8/10A 125V 8/B	808015		333.600 (N-8/10A-125V-8/B)	346010	N 6/10	HN 1/2 to 3/4

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuner	47U130	VHF Ch. 130445W
	Tuner	47U103	VHF Ch. 130434W
	Tuner	47U113	VHF Ch. 130434N
	Tuner	47U104	VHF, With UHF Provisions, Ch. 130435Y
	Tuner	47U115	VHF, With UHF Provisions, Ch. 130435P
	Tuner	47U128	UHF-VHF, Includes VHF Tuner With UHF Provisions Part #962285, and UHF Tuner Part #962284, Ch.130446Y
	Tuner	47U106	UHF Ch. 130435P, Y
	Printed Board	47U116	Complete with Components, Less Tubes, Ch. 130434N, 130435P
	Printed Board	47U125	Complete with Components, Less Tubes, Ch. 130445W, 130446Y

EMERSON MODELS 1466, 1467, 1470, 1471 (Ch. 130434N, W, 130435P, Y, 130445W, 130446Y)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

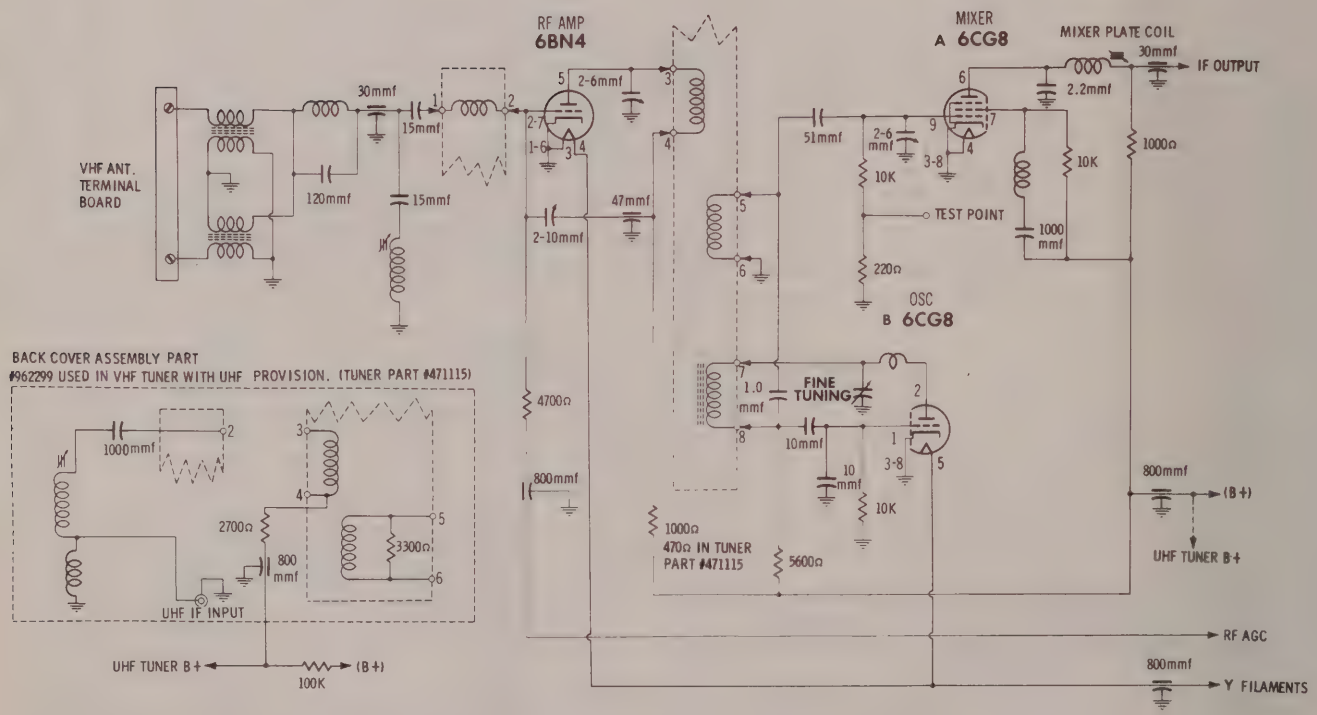
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	520261	Models 1470, 1471
Safety Glass	520266	Models 1466, 1467
Mask	460933B	Models 1470, 1471
Mask	461016A	Models 1466, 1467
Knob	460918B	Fine Tuning, Models 1470, 1471
Knob	460765B	Fine Tuning, Models 1466, 1467
Knob	460920B	Channel Selector, Model 1466
Knob	460988	Channel Selector, Model 1470
Knob	460989	Channel Selector, Model 1467
Knob	460928B	Channel Selector, Model 1471
Knob	460991	UHF Tuning, Model 1467
Knob	460940A	UHF Tuning, Model 1471
Knob	460990	UHF Dial, Model 1467
Knob	460939A	UHF Dial, Model 1471
Knob	461033	Contrast, Brightness, Vert. Hold, Horiz. Hold, Models 1470, 1471
Knob	461021A	Contrast, Brightness, Vert. Hold, Horiz. Hold, Models 1466, 1467
Knob	460919B	Volume, Models 1470, 1471
Knob	461020A	Volume, Models 1466, 1467
Knob	461027	On-Off, Models 1470, 1471

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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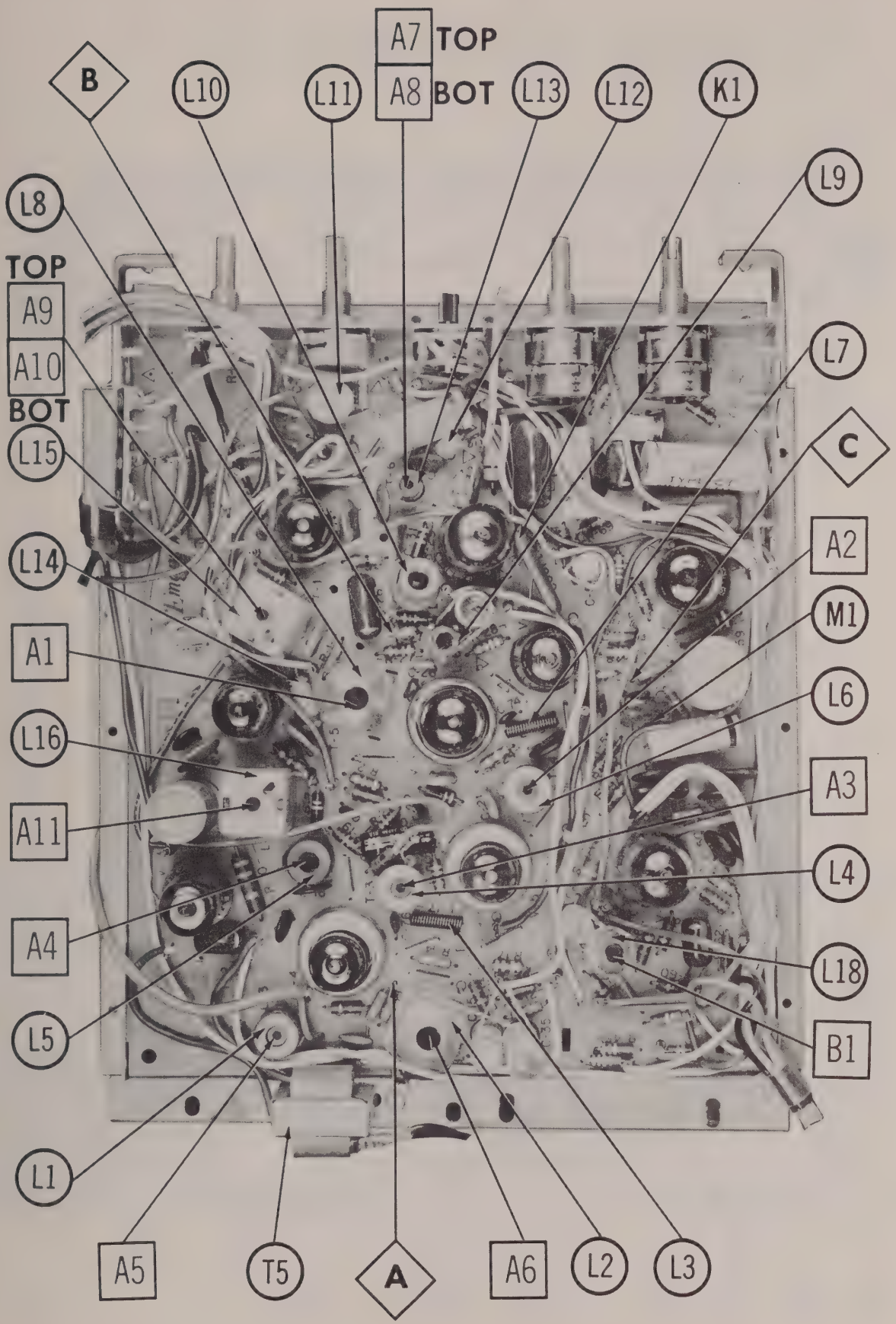
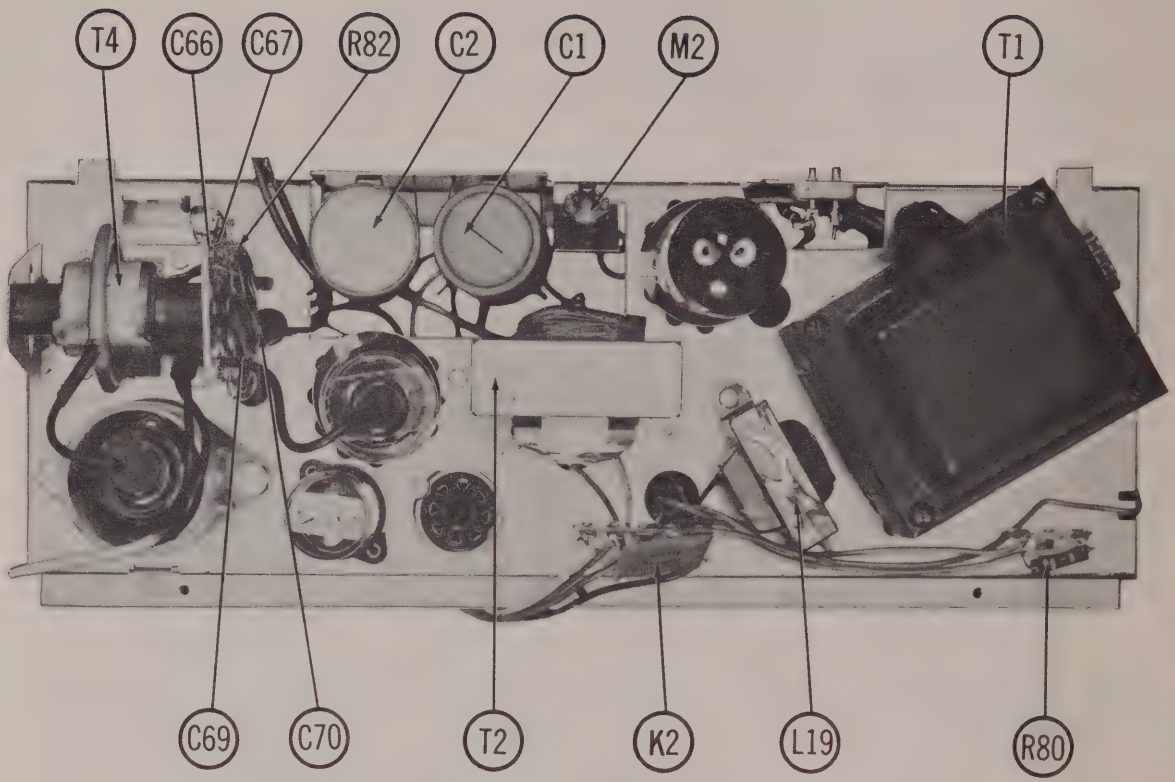
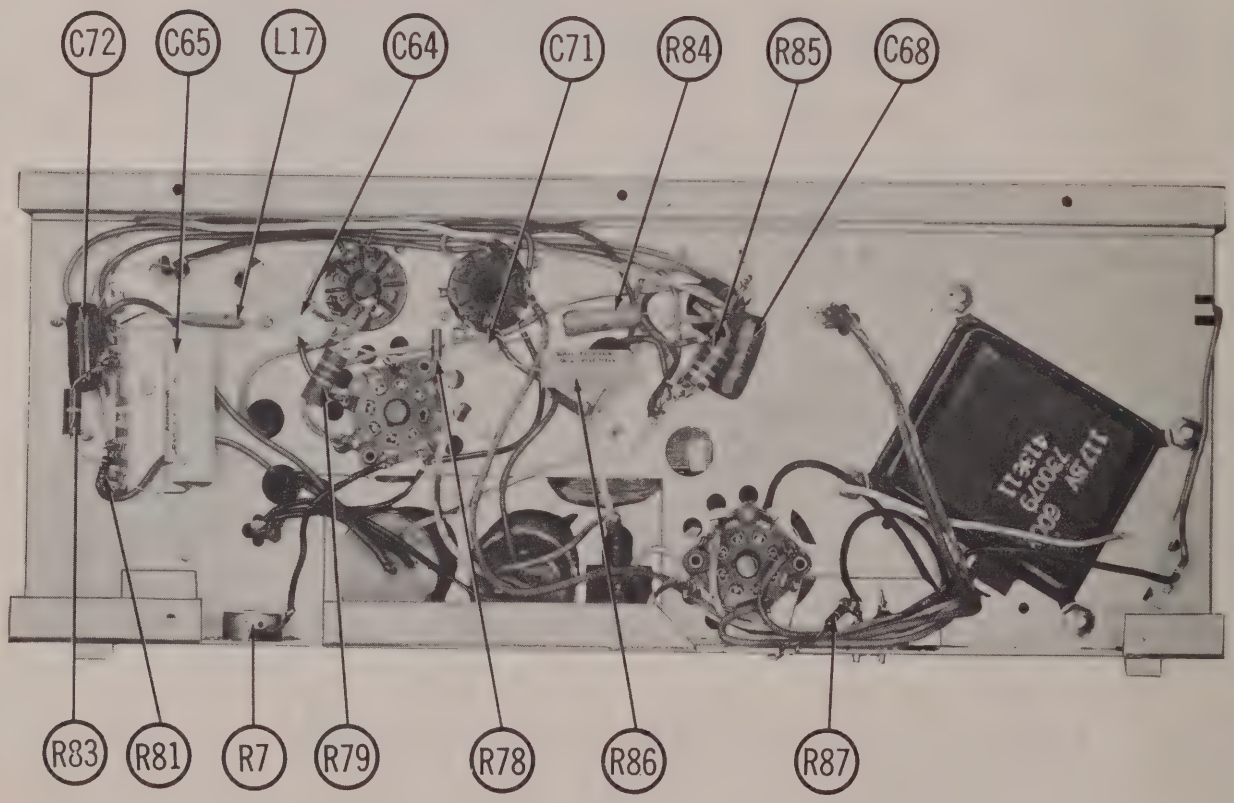


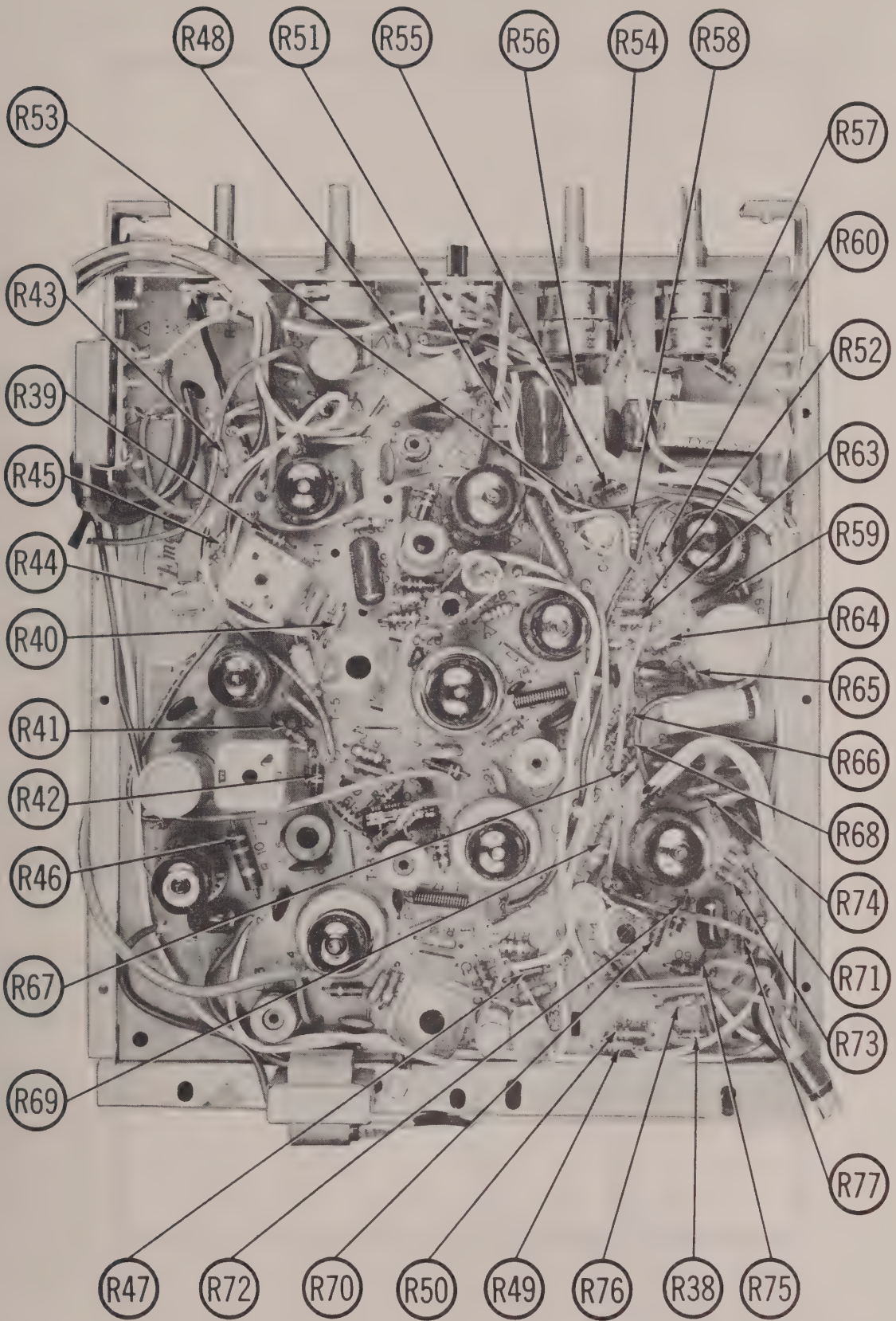
INDUCTOR & ALIGNMENT IDENTIFICATION



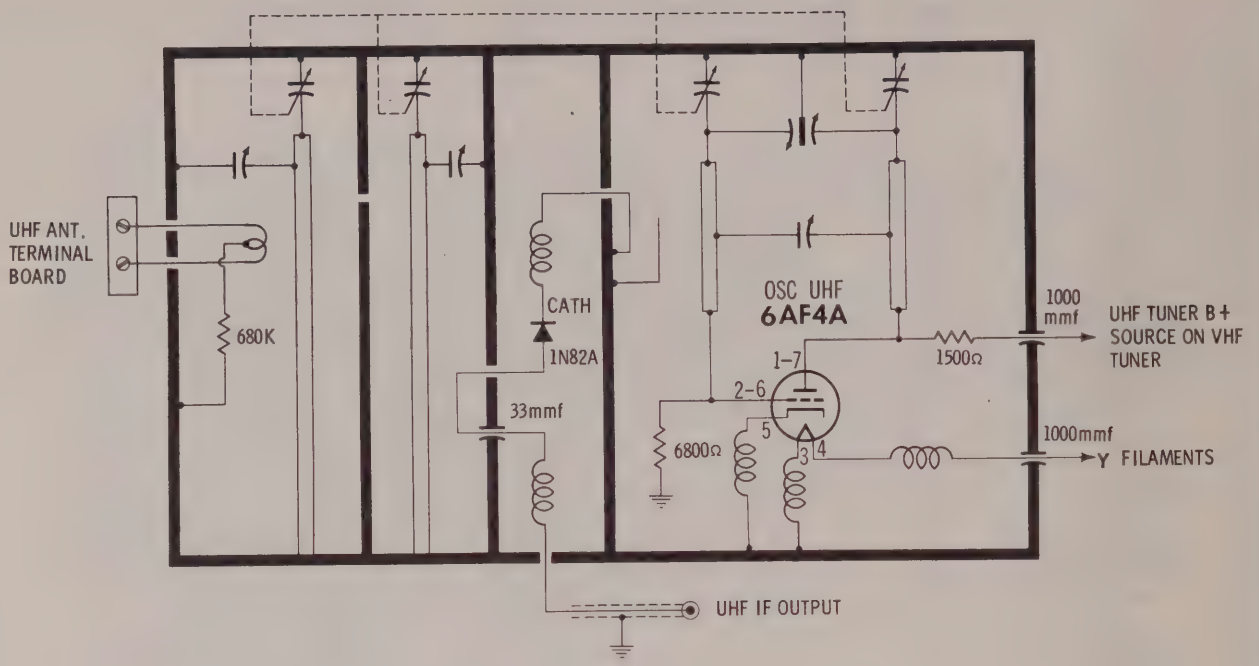
POWER CHASSIS - TOP VIEW



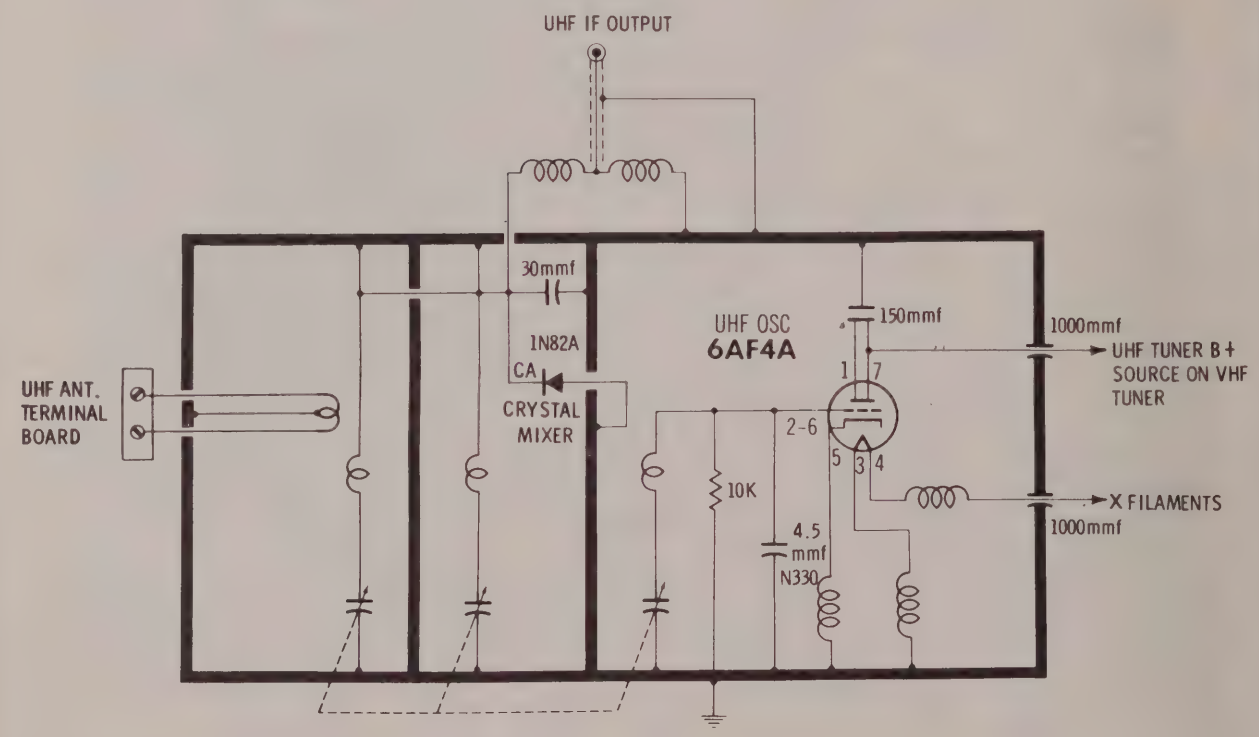
POWER CHASSIS - BOTTOM VIEW



RESISTOR IDENTIFICATION (R38 THRU R77)



UHF PART OF TUNER 471128 (962284)



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UHF TUNER 471105

TUNER PARTS LIST AND DESCRIPTIONS

471103

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6AT8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100								N2200
C202	12					C10Q12C			NPO 10%
C203	15			N750-DI 15	DTN-15	C10Q15U		5TCC-Q15	N750
C204	2.7								NPO 10%
C205	1000		961969	EF-001	MFT-1000			503C-D1	
C206	1000		961969	EF-001	MFT-1000			503C-D1	
C207	120								N2200 10%
C208	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	10%
C209	18					C10Q18C			NPO
C210	1.2								10%
C211	2.2			NPO-SI 2.2	TCZ-2R2	C10V22C		5TCCB-V22	NPO 10%
C212	39								N750 5%
C213	1000		961969	EF-001	MFT-1000			503C-D1	
C214	6.8			NPO-SI 6.8	TCZ-6R8	C10V68C	ZT-5568	5TCCB-V68	
C215	10			NPO-SI 10	TCZ-10	C10Q1C	ZT-541	5TCC-Q1	
C216									
C217	1.5								N2200
C218	1000		961969	EF-001	MFT-1000			503C-D1	
C219	1000		961969	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

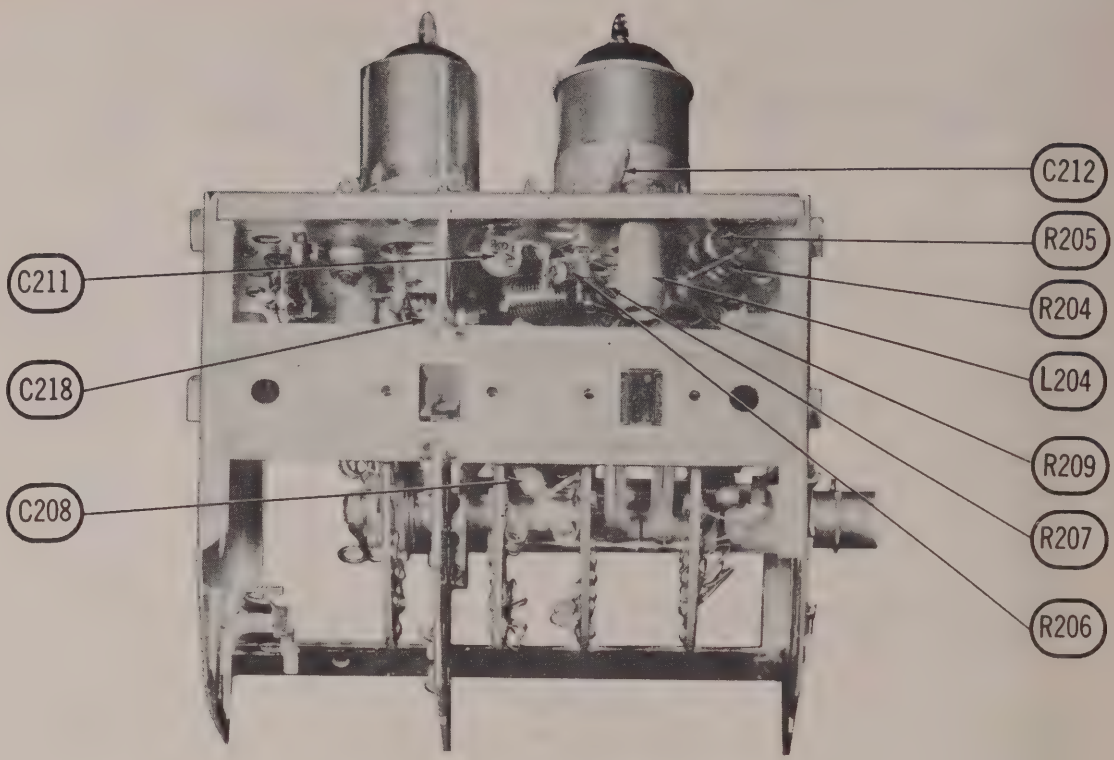
ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R201	10K			
R202	18K			
R203	47K			
R204	3300Ω			
R205	100K			

ITEM No.	RATING		EMERSON PART No.	NOTES
	OHMS	WATT		
R206	47K			
R207	1800Ω			
R208	15K			
R209	4700Ω			

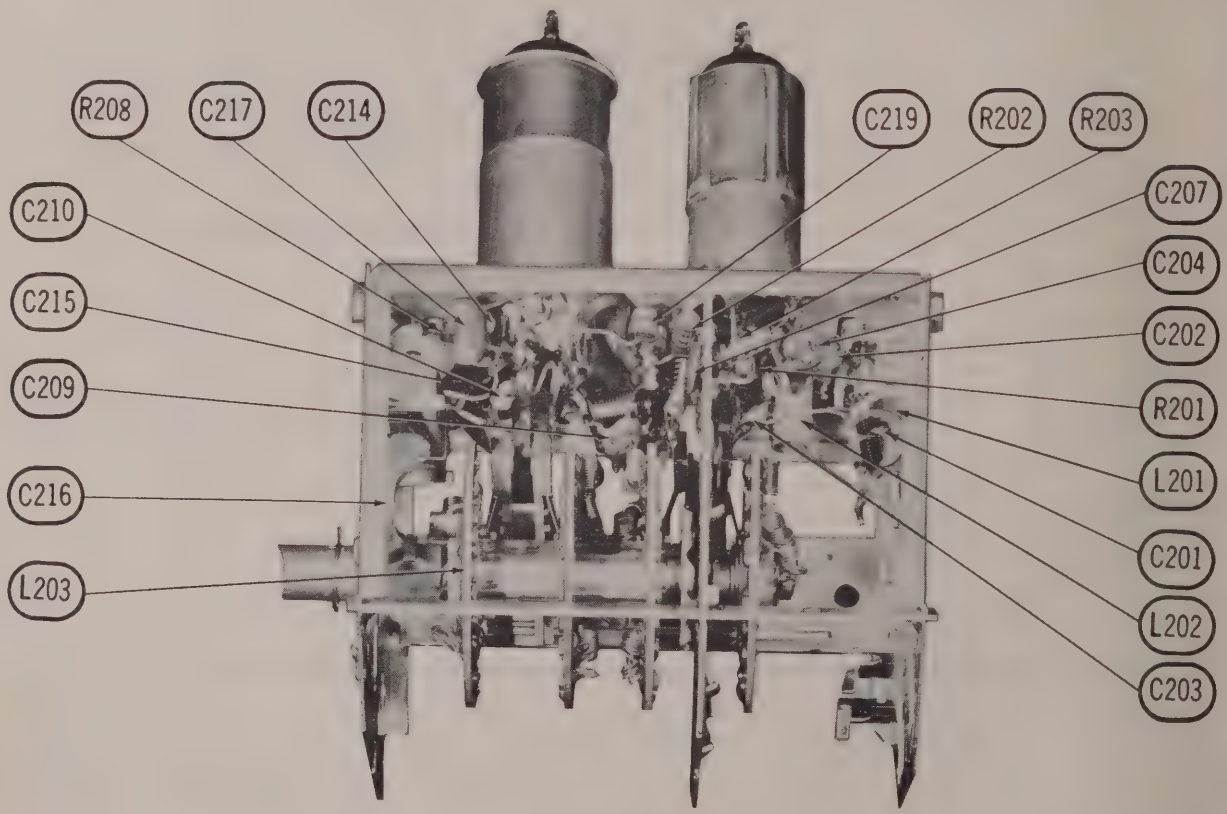
COILS (RF-IF)

ITEM No.	USE	EMERSON PART No.	NOTES
L201	Ant. Trans.	962267	Includes trap
L202	IF Trap	962270	
L203	Ant., RF, Mixer Grid, Osc. Coils	962268	Channel 2-13, Includes shaft & Switch Assy.

ITEM No.	USE	EMERSON PART No.	NOTES
L204	Mixer Plate Coil	962269	



TUNER 471103 - LEFT SIDE



TUNER 471103 - RIGHT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	1.2meg	56Ω	0Ω	.1Ω	††470Ω	††470Ω	0Ω		
V2	6CB6	†20K	††47Ω	0Ω	.1Ω	†1100Ω	†1000Ω	¶		
V3	6AS8	†47K	0Ω	180Ω	.1Ω	0Ω	4700Ω	0Ω	.1Ω	†47K
V4	12BY7A	82Ω	470K	0Ω	.1Ω	.1Ω	0Ω	†5500Ω	†3300Ω	0Ω
V5	6AU6	▲2.2Ω	†47K	.1Ω	0Ω	†940Ω	†940Ω	††220Ω		
V6	6DT6	5.5Ω	560Ω	.1Ω	0Ω	†270K	†5500Ω	560K		
V7	6AQ5A	0Ω	330Ω	.1Ω	0Ω	†1900Ω	†1500Ω	0Ω		
V8	6CS6	†730K	0Ω	0Ω	.1Ω	†40K	†11K	1.3meg		
V9	6DE7	†365Ω	●1.1meg	●1.1meg	0Ω	.1Ω	●‡2.5meg	●1.2meg	0Ω	470Ω
V10	6CG7	†100K	●170K	1200Ω	0Ω	.1Ω	†15K	2meg	1200Ω	0Ω
V11	6DQ6A	TP	.1Ω	NC	†10K	1meg	NC	0Ω	● 23Ω	TOP CAP ‡14Ω
V12	6DA4	NC	NC	¶2.7meg	NC	†28.4Ω	NC	.1Ω	0Ω	
V13	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡534Ω
V14	5U4GB	NC	¶	TP	30Ω	NC	29Ω	NC	¶	
V15	21DAP4	0Ω	56K	†470Ω	†470Ω	NC	NC	90K	.1Ω	
V201	6CY5	2.8meg	0Ω	0Ω	.1Ω	†3500Ω	†17K	0Ω		
V202	6AT8	15K	†8000Ω	0Ω	0Ω	.1Ω	†5100Ω	†3500Ω	0Ω	100K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 260V SOURCE.

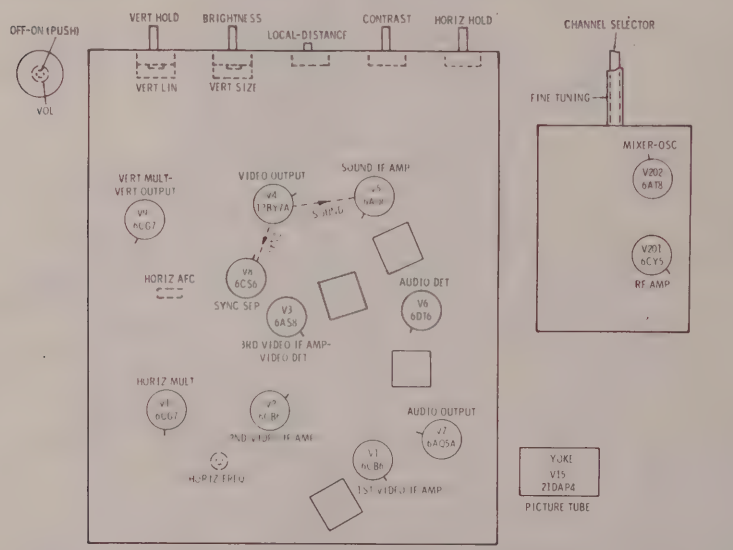
‡ MEASURED FROM PIN 3 OF V12.

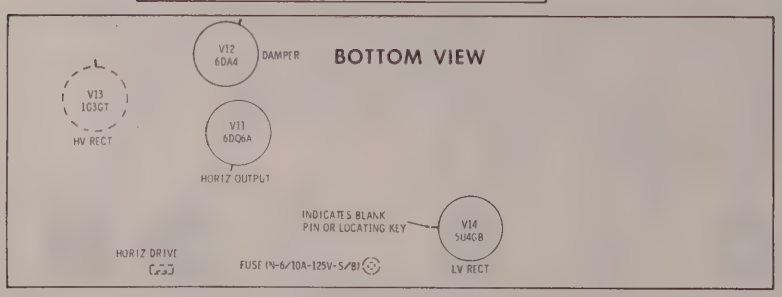
†† MEASURED FROM PIN 7 OF V2.

▲ MEASURED FROM PIN 2 OF V5.

NC NO CONNECTION

TP TIE POINT.





TUBE PLACEMENT CHART

PHOTOFACT* Folder with CIRCUITRACE*

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D, E, F, H, J, K, L, M, N, P, R

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs from the side.
2. Remove 12 wood screws and 1 metal clip holding the rear cover. Remove rear cover.
3. Remove picture tube socket, yoke plug, HV and speaker leads.
4. Remove 2 hex nuts holding tuner support bracket.
5. Remove 2 metal screws holding control panel bracket.
6. Remove 2 bottom chassis bolts and 2 top hex nuts holding chassis to mounting brackets.
7. Remove chassis from rear of cabinet.

MODEL 21T9215 (Ch. KCS122E)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21T9132, 21T9135, 21T9137	KCS122A
		21T9396, 21T9397, 21T9399	KCS122AD
		21T9396U, 21T9397U, 21T9399U	KCS122AE
		21T9132U, 21T9135U, 21T9137U	KCS122B
		21T9152, 21T9155, 21T9156, 21T9157	KCS122C
		21T9152U, 21T9155U, 21T9156U, 21T9157U	KCS122D
		21T9215, 21T9216, 21T9217, 21T9235, 21T9236, 21T9237, 21T9238	KCS122E
		21T9215U, 21T9216U, 21T9217U, 21T9235U, 21T9236U, 21T9237U, 21T9238U	KCS122F
		21T9255, 21T9256, 21T9257, 21T9258	KCS122H
		21T9255U, 21T9256U, 21T9257U, 21T9258U	KCS122J
		21T9315, 21T9316, 21T9317, 21T9318, 21T9415, 21T9417	KCS122K
		21T9315U, 21T9316U, 21T9317U, 21T9318U, 21T9415U, 21T9417U	KCS122L
		21T9355, 21T9356, 21T9357	KCS122M
		21T9355U, 21T9356U, 21T9357U	KCS122N
		21T9225, 21T9226, 21T9227	KCS122P
		21T9225U, 21T9226U, 21T9227U	KCS122R
MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 175 Watts, 1.63 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D, E, F, H, J, K, L, M, N, P, R

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. Channel 13 adjustment is located on top front of tuner next to mixer tube and should be adjusted first. Channel 12 adjustment is located at 2 o'clock, proceed in counterclockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 phillips screws holding metal frame and safety glass at bottom ledge.
Remove metal frame and safety glass by pulling bottom SLIGHTLY out and lifting up.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, It is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Waveform slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A Thermal Switch (M6) is used for low voltage power supply protection. A 9Ω fusible resistor (R94) is used for horizontal sweep circuit protection and 3 fuse wires for filament protection.

CENTERING

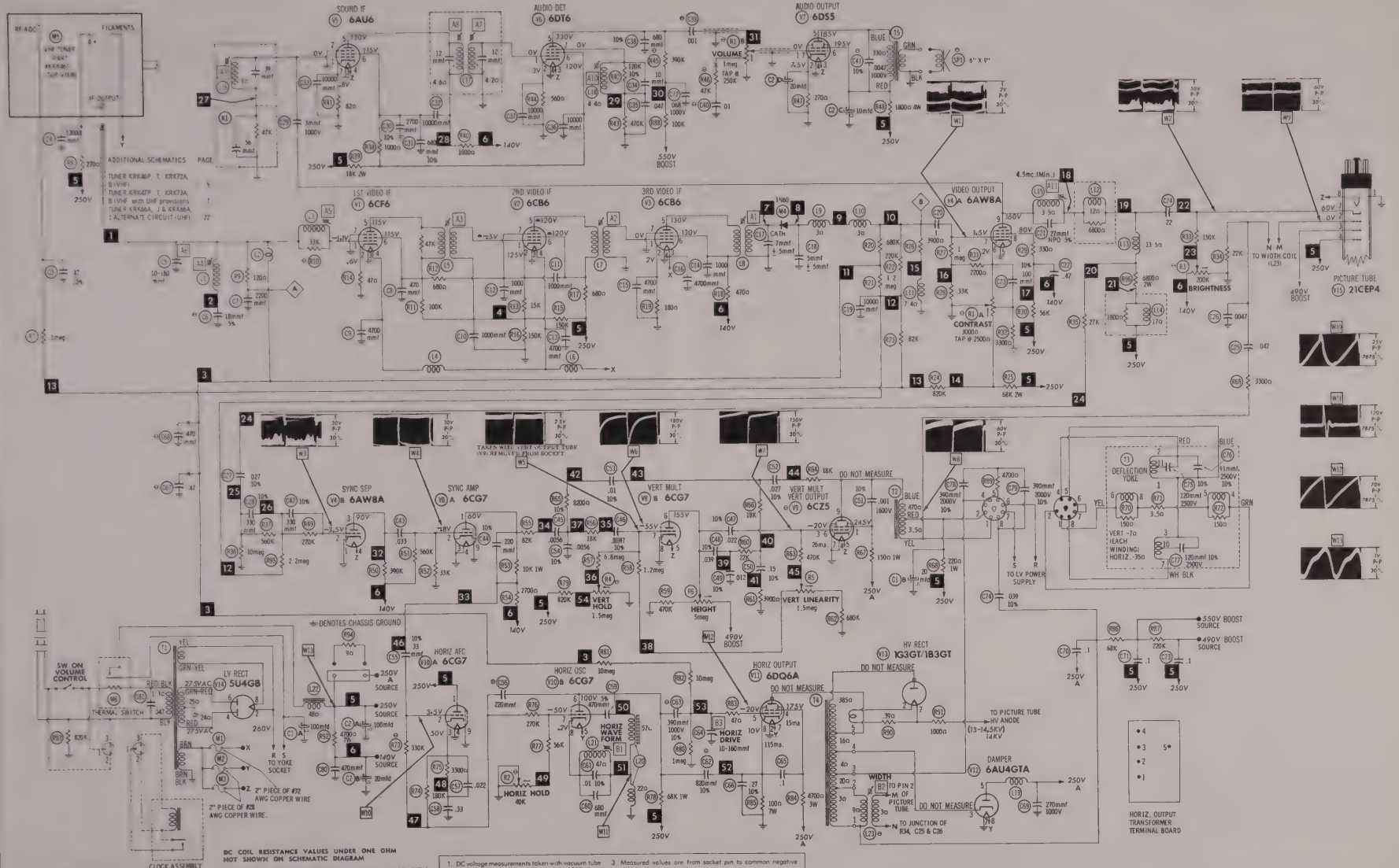
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H856

SET 420 FOLDER 3



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied

▲ MEASURED FROM PIN 7 OF V2.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE® (Trade Mark)

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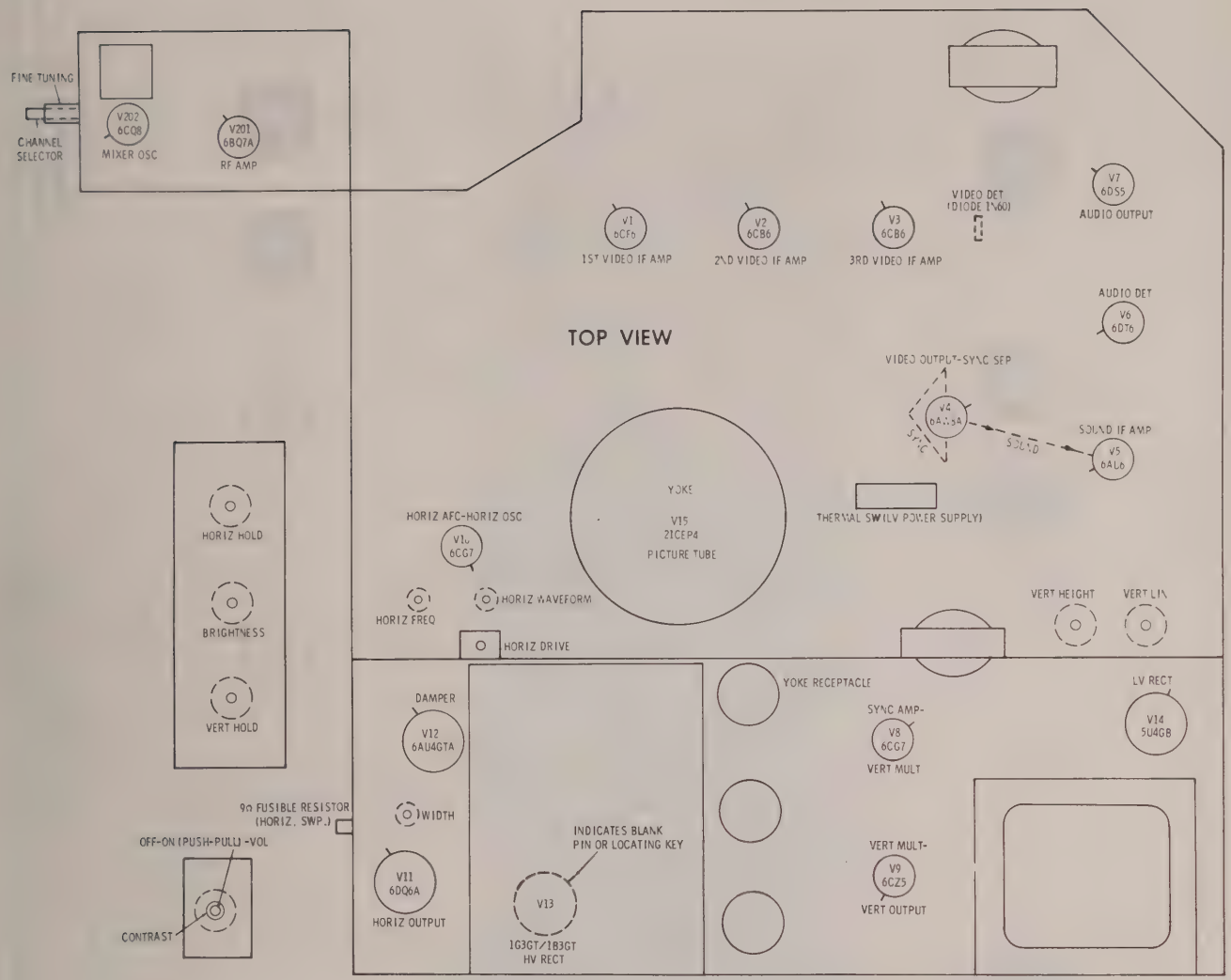
RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D, E, F, H, J, K, L, M, N, P, R

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

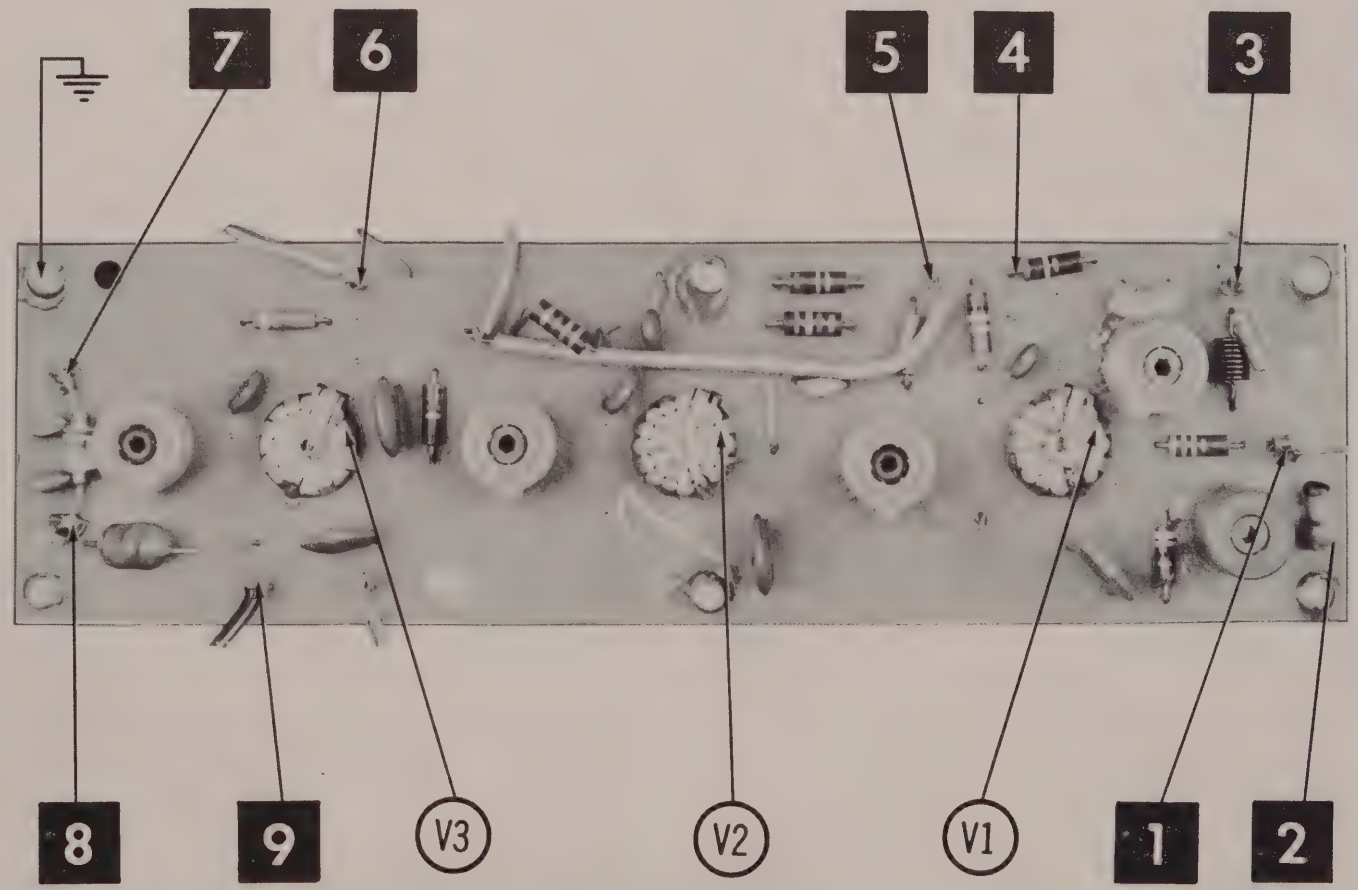
POWER SUPPLY FAILURE
No raster, no sound Thermal Switch (M6), Fuse Wire (M1, M2, M3), V14

SWEEP FAILURE
No raster, has sound Fusible Resistor (R94), V10, V11, V12, V13, V15
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V4, V3, Diode (M4), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V4, V8
No horiz. sync V4, V8, V10
No vert. or horiz. sync V4, V8

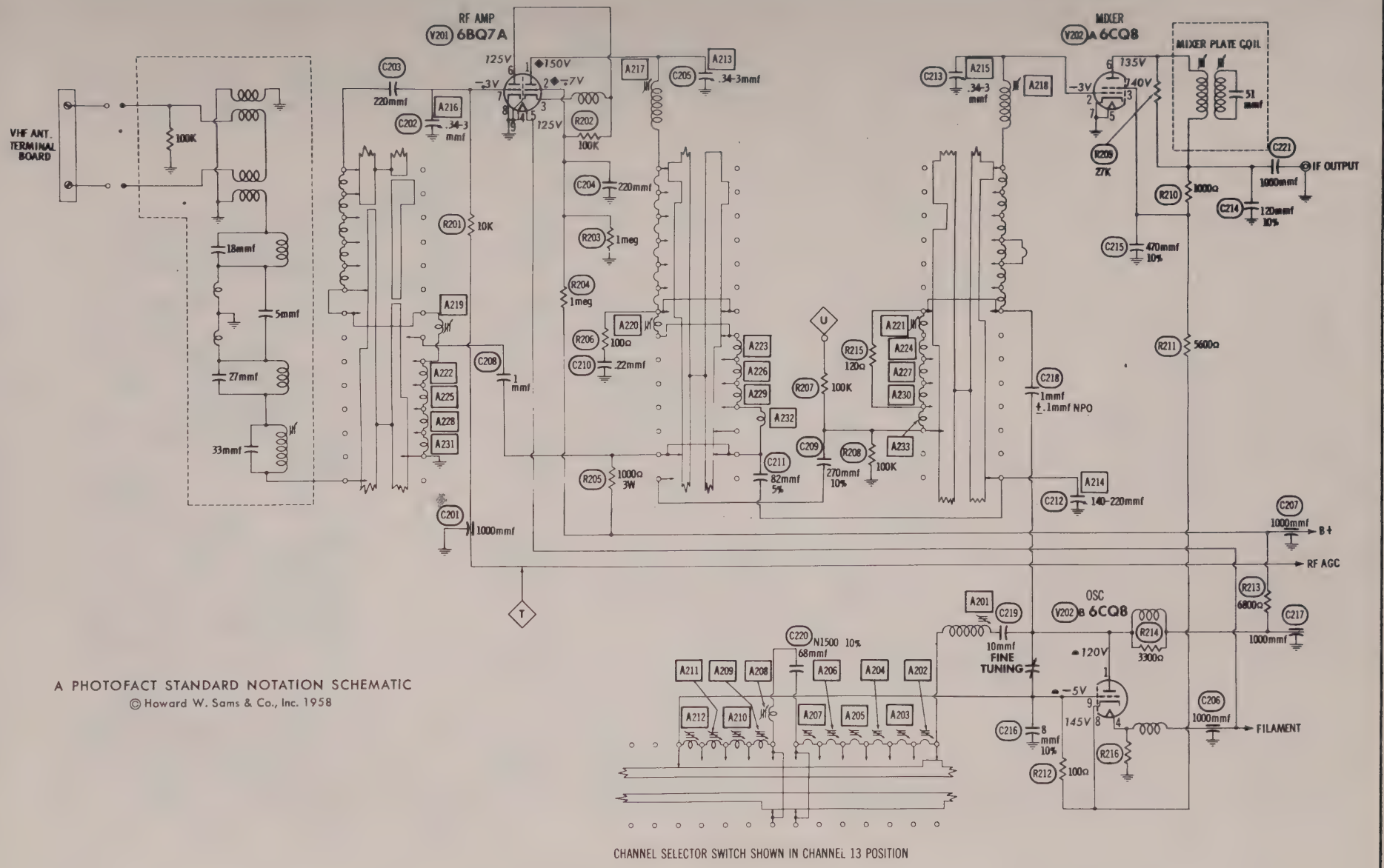
CircuiTrace Numbers 1 thru 9



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

VIDEO IF
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF TUNER KRK46P, T, KRK72A, B

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D,
E, F, H, J, K, L, M, N, P, R

FOLDER 3

TUNER PARTS LIST AND DESCRIPTIONS

KRK 46T

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CQ8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1000		105660	EF-001	MFT-1000			503C-D1	
C202	.34-3		105757						
C203	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C204	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C205	.34-3		105757						
C206	1000		105660	EF-001	MFT-1000			503C-D1	
C207	1000		105660	EF-001	MFT-1000			503C-D1	
C208	1		77690						
C209	270		77838		D6-271	L10T27		MS-327	10%
C210	.22		105857						
C211	82		103560	1469-000082		22R5Q82		MS-482	5%
C212	140-220		103519						
C213	.34-3		105757						
C214	120		106194		D6-121	L10T12		MS-312	10%
C215	470		78622		D6-471	5R5T47		MS-347	10%
C216	8		106043						10%
C217	1000		105660	EF-001	MFT-1000			503C-D1	
C218	1		105781						±.1mmf NPO
C219	10			NPO-SI 10	TCZ-10	CTA6Q1C	ZT-541	5TCC-Q1	①
C220	68		105855						N1500 10%
C221	1000		105660	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	

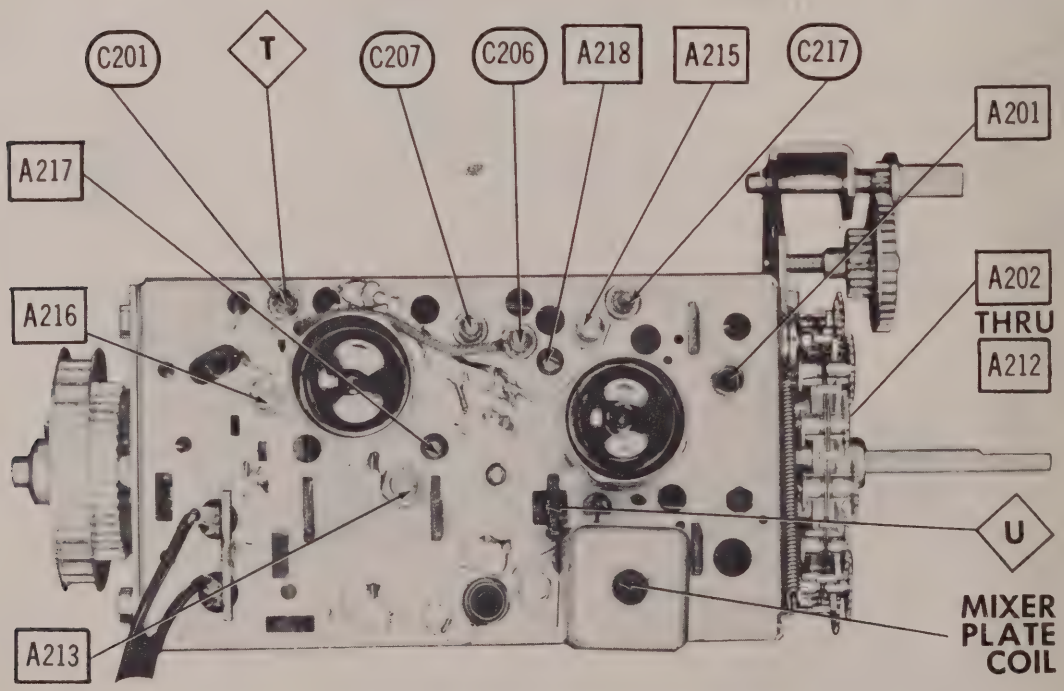
① Some versions may use 12mmf 5% in this application (Part #106193).

RESISTORS

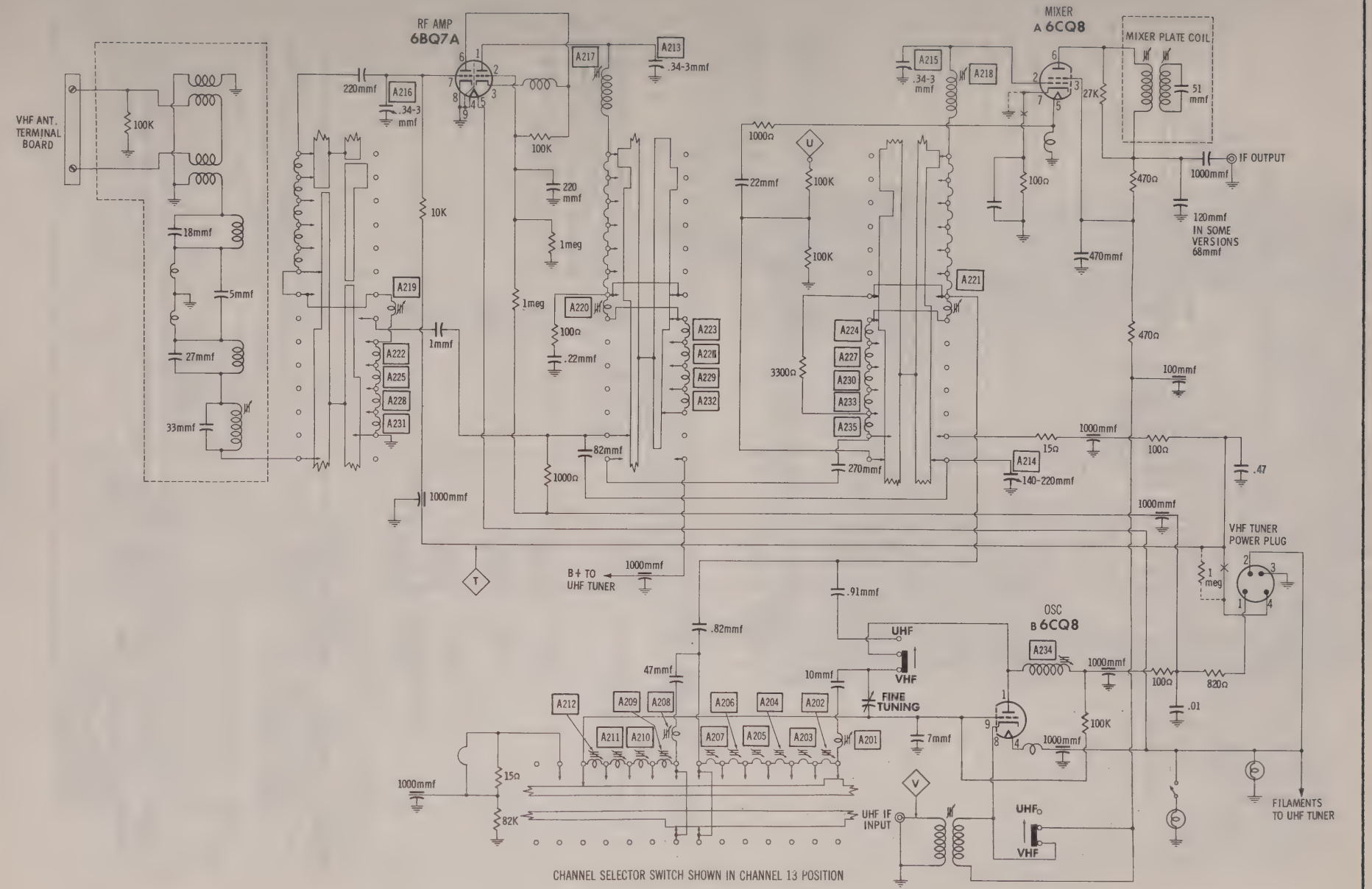
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R201	10K			
R202	100K			
R203	1meg			
R204	1meg			
R205	1000Ω	3	106042	
R206	100Ω			
R207	100K			
R208	100K			

ITEM No.	RATING		RCA Victor PART No.	NOTES
	OHMS	WATT		
R209	27K			
R210	470Ω			
R211	1000Ω			
R212	5600Ω			
R213	100Ω			
R214	6800Ω			
R215	3300Ω			
R216	120Ω			



TUNER KRK 46T —TOP VIEW



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF TUNER W/UHF PROVISIONS KRK47P, T, KRK73A, B

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D,
E, F, H, J, K, L, M, N, P, R

TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓣ. Positive to chassis.
Unplug IF output cable from the tuner and connect a 39Ω resistor across the socket.
Unplug UHF tuner (if used) and plug adaptor (shown in Fig. 203) in its place.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The Sweep Generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough Sweep Generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	Not used	257MC	13	Vert. Amp. thru diode probe to point Ⓤ. Low side to chassis.	A201	Adjust for zero beat on scope.
2.	"	"	"	251MC	12	"	A202	"
3.	"	"	"	245MC	11	"	A203	"
4.	"	"	"	239MC	10	"	A204	"
5.	"	"	"	233MC	9	"	A205	"
6.	"	"	"	227MC	8	"	A206	"
7.	"	"	"	221MC	7	"	A207	"
8.	"	"	"	129MC	6	"	A208	"
9.	"	"	"	123MC	5	"	A209	"
10.	"	"	"	113MC	4	"	A210	"
11.	"	"	"	107MC	3	"	A211	"
12.	"	"	"	101MC	2	"	A212	"
13.	"	"	183MC	181.25MC 185.75MC	8	"	A213, A214, A215, A216	Adjust for maximum gain and symmetry of response similar to Fig. 202. with markers as shown. Adjust A213 for marker position, A214 for proper bandwidth, A215 for proper tilt and A216 for maximum gain.
14.	"	"	213MC	211.25MC 215.75MC	13	"	A217, A218	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A217 for proper marker positions, A218 for proper tilt and retouch A214 for proper bandwidth.
15.	Repeat steps 13 and 14 for proper tracking and response on all channels from 13 to 7. Repeat step 1. Turn off generators and measure oscillator injection voltage at point Ⓤ with VTVM. The reading obtained should be between -2.5 to -5.5 volts for VHF only tuner -1.5 to -4.75 for UHF-VHF. If outside these limits, replace V202 and repeat steps 1 thru 14.							
16.	Repeat step 8.							
17.	Fig. 201	Across antenna terminals thru pad (Fig. 201).	85MC	83.25MC 87.75MC	6	Vert. Amp. thru diode probe to point Ⓤ. Low side to chassis.	A219, A220, A221	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Adjust A219 for maximum gain, A220 for proper marker positions and A221 for proper tilt.
18.	"	"	79MC	77.25MC 81.75MC	5	"	A222, A223, A224	If necessary, adjust appropriate coil for response similar to Fig. 202.
19.	"	"	69MC	67.25MC 71.75MC	4	"	A225, A226, A227	"
20.	"	"	63MC	61.25MC 65.75MC	3	"	A228, A229, A230	"
21.	"	"	57MC	55.25MC 59.75MC	2	"	A231, A232, A233	"

UHF ALIGNMENT FOR UHF-VHF TUNERS

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 203	High side thru adaptor (Fig. 203) to point Ⓥ. Low side to chassis.	44MC	41.25MC 45.75MC	UHF	Connect 330mmf capacitor in series with a 180Ω resistor from plate of Mixer (V202) to chassis with resistor next to chassis. High side of scope thru diode probe to junction of capacitor and resistor Low side to chassis.	A234, A235	Use only enough Sweep Generator output to provide a usable pattern on scope. Adjust A234 and A235 for response similar to Fig. 204.
23.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead. Reconnect cable from UHF tuner to VHF tuner. Connect separate marker generator loosely to grid of 1st. Video IF Amp. (V1).	Tune over entire UHF range.	42.5MC 45.0MC 45.75MC	Tune over entire UHF range	Across video detector load.		Use only enough Sweep Generator output to provide a usable pattern on scope. Check tracking across UHF band and if necessary, retouch A234 and A235 for response similar to Fig. 205.

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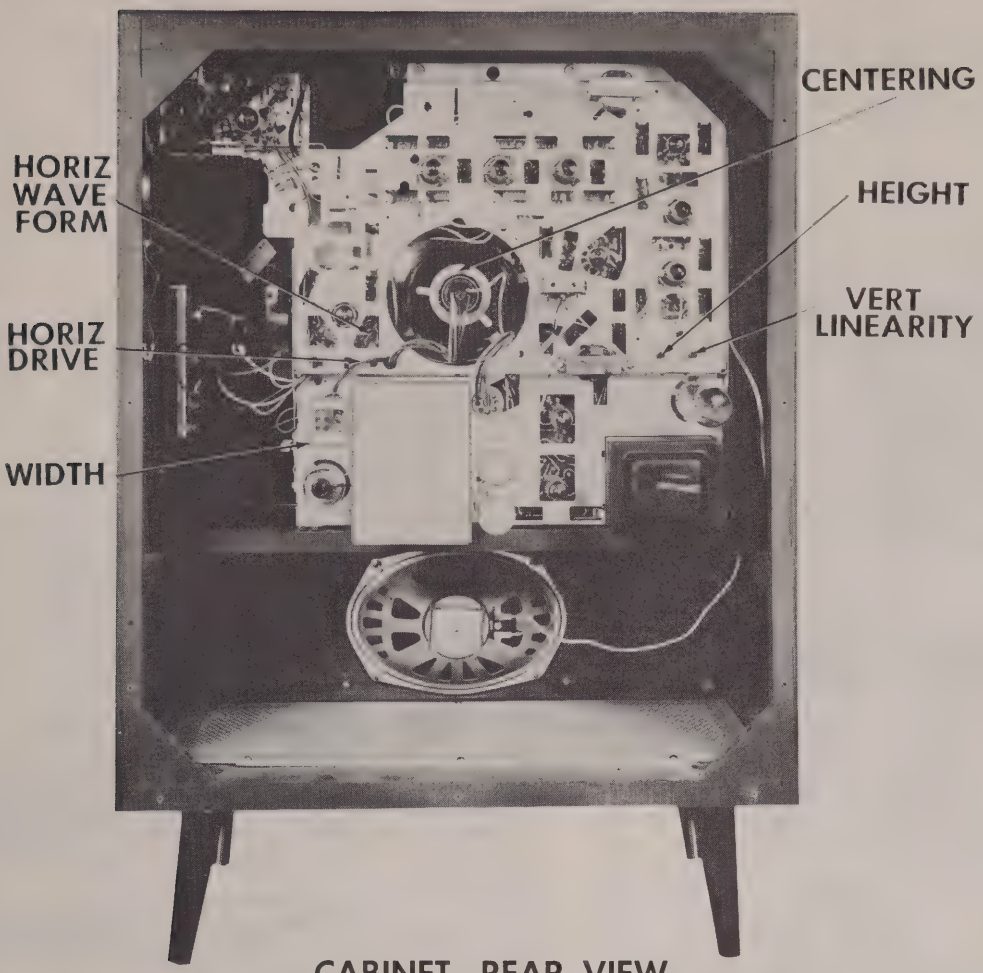


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested alignment tools:

B1 ..... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545
B2 ..... General Cement #8727 or 8722
Walsco #2519
B3 ..... General Cement #5000, 5009, 9291
Walsco 2522, 2515

Before adjusting the Waveform slug (B1), the Horizontal Drive and Width must be properly adjusted.

Set the Horizontal Hold control to the pull-in point. Turn the Width slug (B2) fully counterclockwise and turn Horizontal Drive trimmer (B3) counterclockwise until a bright vertical line appears near the center of the raster, then turn clockwise until the line just disappears. If no line appears, leave B3 fully counterclockwise.

With the Brightness control set to normal level, adjust the Width slug (B2) for an overscan of approximately 3/4" on each side of the screen at normal line voltage.

Connect a short jumper across the terminals of the Horizontal Waveform coil (L20) and the grid (pin 2) of the 6CG7 (V10) to chassis with a small screwdriver.

Adjust the Horizontal Hold control for an upright picture (may appear to float back and forth across the screen). Remove the jumper from across L20 and adjust B1 to again obtain a picture in an upright position.

When B1 is properly adjusted, alternately shorting and removing short should not cause the picture to lose sync, but instead cause a slight sideways shift of the picture. Remove the short from the grid of the 6CG7.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools :

A1, A2, A3, A4, A5, A7, A8, A9, All	General Cement #8282, 8606, 8606L, 9295 Walsco #2543, 2544, 2545
A6	General Cement #9291 Walsco #2520, 2522
A10	General Cement #8721, 8722 Walsco #2519

VIDEO IF ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point (A). Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located in left side of tuner shield. Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe to point (B). Common to chassis. (Across Video Detector load)	A1	Adjust for maximum gain. Adjust generator output for 3 volts on meter when finally peaked.
2.	"	"	45.5MC	"	"	A2	"
3.	"	"	43.0MC	"	"	A3	"
4.	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect a 180Ω resistor from pin 5 (plate) to pin 6 (screen) of the 1st. Video IF Amplifier tube (V1).
Couple signal generator loosely to sweep output cable to provide markers.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1500mmf Ceramic Capacitor	High side to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located on left side of tuner shield. Low side to chassis.	45MC (10MC Swp)	42.5MC 45.75MC 47.25MC	4	Vert. Amp. thru detector probe to pin 5 (plate) of 1st. Video IF Amp. (V1). Low side to chassis. Calibrate scope for .5 volts peak to peak.	A5, A6, & Mixer Plate Coil	Use only enough sweep generator output to provide a usable pattern on scope. Adjust Mixer Plate Coil and A5 for maximum gain, using A6 to obtain curve shape with markers as shown in Fig. 1. Remove 180Ω resistor from V1.
6.	"	"	"	"	"	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across Video Det. load) Calibrate scope for 5 volts peak to peak.	A1, A2, A3	Check for response similar to Fig. 2. If necessary, retouch A1, A2 and A3 for desired response.
7.	Fig. 3	High side thru pad (Fig. 3) to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located in left side of tuner shield. Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point (B). Common to chassis.		Adjust generator output to provide exactly 1.5 volts on VTVM.
8.	1500mmf Ceramic Capacitor	Remove pad. High side to Mixer Grid wafer contact thru access hole (adjacent to Mixer Grid wafer) located in left side of tuner shield. Low side to chassis.	45MC (10MC Swp)	41.25MC	"	USE VTVM. DC probe to point (B). Common to chassis. Connect scope as in step 6.	A1, A3	Retouch for 1.0 to 1.5 volts on VTVM while maintaining response similar to Fig. 4 or Fig. 5.
9.	Fig. 6	Across antenna terminals thru matching network (Fig. 6).	Each VHF Channel in turn	42.5MC 45.75MC 47.25MC	All VHF Channels	Vert. Amp. thru 10K to point (B). Low side to chassis.	A1, A2	Retouch A1 and A2 SLIGHTLY to correct for tilt or other condition that is approximately the same on all channels.

SOUND IF ALIGNMENT

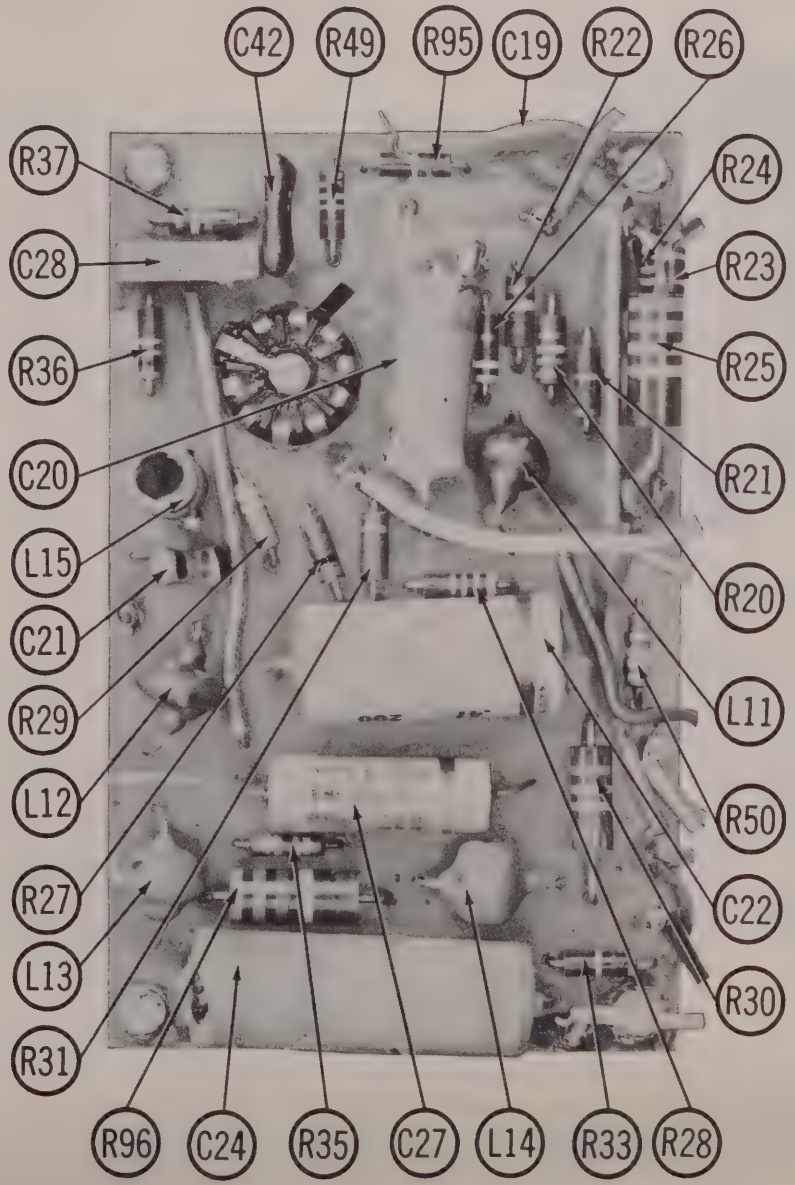
Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
Set Contrast Control fully clockwise.
Set VTVM for negative voltage readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode detector (Fig. 7) to pin 7 (grid 3) of 6DT6 (V6). Common to chassis.	A7, A8, A9	Adjust for maximum negative DC on meter. Attenuate generator for a reading between 1 and 1.5 volts on meter when finally peaked. Peak A7 and A8 with maximum core separation. Adjust A9 for maximum.

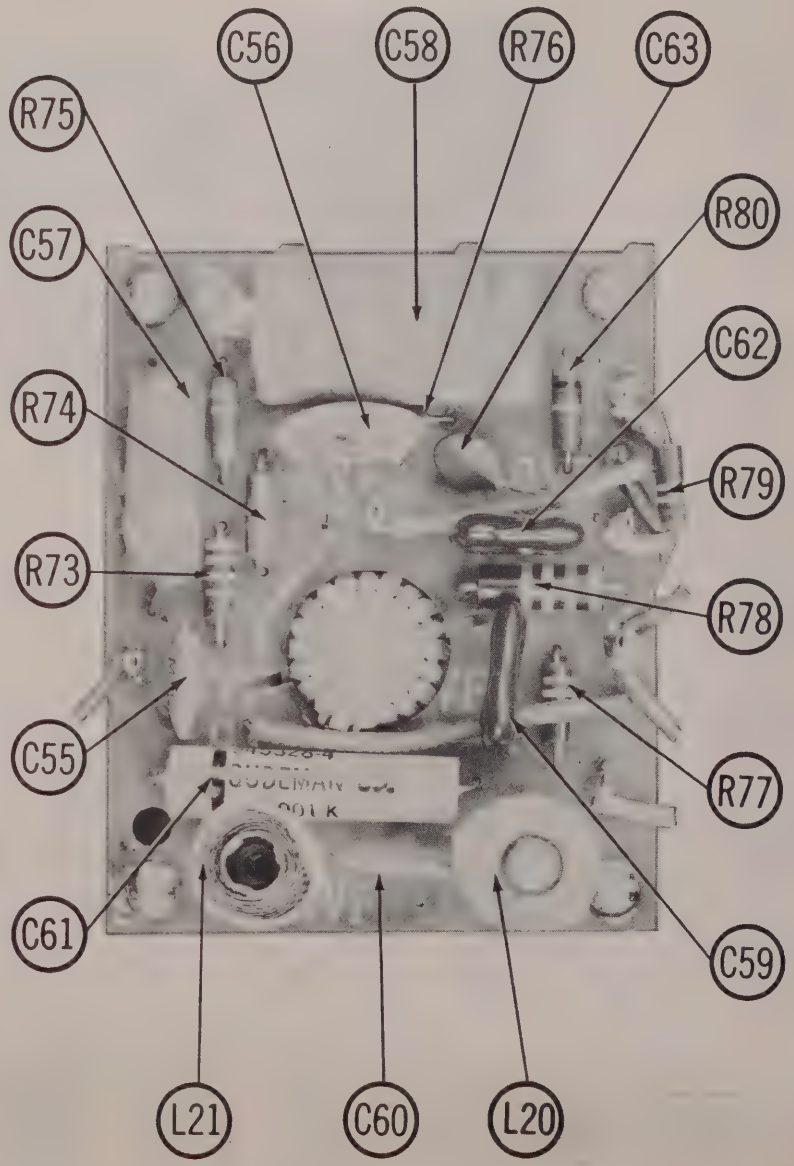
11. Remove VTVM and diode detector. Connect scope across volume control. Turn off signal generator and tune in the strongest signal in the area adjusting volume control for normal volume. Preset coil slug A10 flush with top of coil form. While observing scope and listening to sound output adjust A10 clockwise to a peak. Continue turning clockwise to a second louder peak and adjust for maximum on this second peak.

CONTINUED PAGE 19

CHASSIS TOP VIEW



VIDEO & SYNC PRINTED BOARD



HORIZ PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6CF6	
V2	2nd. Video IF Amp.	6CB6	
V3	3rd. Video IF Amp.	6CB6	
V4	Video Output-Sync Sep.	6AW8A	
V5	Sound IF Amp.	6AU6	
V6	Audio Det.	6DT6	
V7	Audio Output	6DS5	
V8	Sync Amp.-Vert. Mult.	6CG7	
V9	Vert. Mult.-Vert. Output	6CZ5	6EM5 *
V10	Horiz. AFC-Horiz. Osc.	6CG7	
V11	Horiz. Output	6DQ6A	
V12	Damper	6AU4GTA	
V13	HV Rect.	1G3GT/ 1B3GT	
V14	LV Rect.	5U4GB	

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	21CEP4		21CEP4 ①	21CEP4 ②	① "Silverama" Ⓡ ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲100	400	104091	AFH2-100-50	B0726	FP256	TMD-85	D-198	TVL-2813
B	▲20	400							
C2A	▲100	400		AFH4-103-40	D0805	FP389.1		Q-248	TVLS-4666.2
B	▲20	350				TT50X20			
C	■10	400							
D	20	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.47	200	79148A				GEM-2047		10%
C4	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C5	10-160		100849						
C6	18		102646						① 5%
C7	2200		104899	BPD-0022	DD-222	BYA10D22	UC-5222	5GA-D22	
C8	470		78622	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C9	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C10	1000		77252	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C11	1000		102234A	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C12	1000		77252	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C13	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C14	1000		102234A	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C15	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C16	4700		73473	BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C17	7		104177						±.5mmf
C18	5		104178						±.5mmf
C19	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C20	.1	200	105239	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C21	27		100352						NPO 5%
C22	.47	200	104393	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C23	100		105674	NPO-DI 100	DD-101	L10T1	ZT-531	5TCC-T1	10%
C24	.22	600	104148	P688N-22		CUB6P22	GEM-6022	6TM-P22	
C25	.047	600	73553	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C26	.0047	600	73920	P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C27	.027	400	73554						10%
C28	330		102656	1469-00033	D6-331	5R5T33		MS-333	10%
C29	3	1000	102415						
C30	2700		104131			1R5D27		MS-227	10%
C31	680		104135		D6-681	1R5T68		MS-368	10%
C32	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C33	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C34	10		105658	NPO-SI 10	D6-100	L10Q1		MS-41	10%
C35	.047	200	105775	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C36	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C37	10000		73960	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C38	680		104135		D6-681	1R5T68		MS-368	10%
C39	.001	600	104323	P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	②
C40	.01	200	101000A	P288N-01	D6-103	CUB2S1	GEM-211	2TM-S1	③
C41	.0047	1000	73805						④ 10%
C42	330		102656	1469-00033	D6-331	5R5T33		MS-333	10%
C43	.033	400	105318	P488N-033		CUB4S33	GEM-4133	4TM-S33	
C44	220		104144	1469-00022	D6-221	5R5T22		MS-322	10%
C45	.0056	600	104906				GEM-16256		10%
C46	.0047	600	73920				GEM-16247		10%
C47	.022	600	104145	P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C48	.039	400	73790						10%
C49	.012	400	73781						10%
C50	.15	200	104146				GEM-2015		10%
C51	.001	1600	73849				GEM-1621		10%
C52	.027	600	75345						10%
C53	.01	200	79316				GEM-411		10%
C54	.0056	400	73788				GEM-16256		10%
C55	33		105348	NPO-DI 33	DD-330	L10Q33	ZT-5433	5TCC-Q33	10%
C56	220		105245		DD-221	L10T22		MS-322	10% ⑤
C57	.022	400	105670	P488N-022		CUB4S22	GEM-4122	4TM-S22	
C58	.33	200	105671	P288N-33		CUB2P33	GEM-2033	2TM-P33	
C59	470		105672	1464-00047		5R5T47		MS-347	5%
C60	680		105518	BPD-00068	D6-681	BYA10T68	UC-5368	5GA-T68	
C61	.01	100	105676				GEM-1611		10%
C62	820		106080	1464-00082		1R5T82		MS-382	10% ⑥
C63	390	1000	105675						10% ⑦
C64	10-160		102412						

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C65	1	600	73557	P688N-1	DF-104	CUB4P1	GEM-601	6TM-P1	
C66	.27	200	73786						10%
C67	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C68	470			BPD-00047	D5-471	BYAUT47	UC-5347	5GA-T47	
C69	270	1000	76579						
C70	1	600	73557	P688N-1	DF-104	CUB4P1	GEM-601	6TM-P1	
C71	1	400	73551	P688N-1	DF-104	CUB4P1	GEM-601	6TM-P1	
C72	.068	1000	73615	P1588N-068		CUB10S68	GEM-10S68	10TM-S68	
C73	1	400	73551	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C74	.039	600	73790						10%
C75	120	2500	103536						10%
C76	91	2500	103535						10%
C77	.20	2500	103536						10%
C78	390	2000	104696						10%
C79	390	2000	104691						10%
C80	470		77283	BPD-00047	DD-471	BYAUT47	UC-5347	5GA-T47	
C81	.047	600	73592	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

1 Ch. KCS122AD, AE, M, N use 12mmf 5% in this application (Part #106330).
2 Ch. KCS122A, B use .0022mfd in this application.
3 Not used in Ch. KCS122A, B.
4 Ch. KCS122A, B use .0033mfd in this application.
5 Some versions may use 100mmf in this application.
6 Some versions may use 560mmf in this application.
7 Some versions may use 470mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	300Ω		106233				UE405-S	Contrast, Tap ② 2500Ω ①
B	1meg						Not Req.	Volume, Tap ③ 250K ①
C	Switch						Not Req.	Pull Type
R2	60K		106227					Horiz. Hold ②
R3A	200K		104088	B-46	A47-200K-S	Q1-139	U43	Brightness ①
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	.5meg		104089	B-742	A47-.5meg -S	Q1-138	U155	Vert. Hold ④
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	.5meg		102408	AB-742	B47-.5meg -S	B11-138	TA155L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TM2	Not Req.	
R6A	5meg		100290	AB-87	B47-5meg-S	B11-141	PTA56L	Height
B	Shaft			AK-19	Not Req.	TM3	Not Req.	

① Used in Ch. KCS122E, F, Ch. KCS122P, R use Part #106211. Ch. KCS122AD, AE, C, D, M, N use Part #106322.
② Part #106228 is used in Ch. KCS122C, D, F, R.
③ Part #106225 is used in Ch. KCS122C, D, F, R.
④ Part #106226 is used in Ch. KCS122C, D, F, R.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R1	10meg		502350	
R2	270Ω		502327	
R3	33K		502232	Note 1
R4	150K		502430	
R5	680Ω		502268	
R6	15K		502315	
R7	100Ω		502047	
R8	150K		502415	
R9	560K		502425	
R10	680Ω		502268	
R11	470Ω		502247	
R12	1.8K		502318	
R13	680K		502428	
R14	.5meg		502405	
R15	220K		502422	
R16	82K		502382	
R17	68K		502368	
R18	3300Ω		502233	
R19	33K		502332	
R20	33Ω		502133	
R21	56K		502356	
R22	220Ω		502222	
R23	33K		502332	
R24	330K		502433	
R25	27K		502327	
R26	10meg		502610	
R27	560K		502456	
R28	100Ω		502210	
R29	68K	2	502368	
R30	100Ω		502210	
R31	22K		502322	
R32	1K		502310	
R33	150K		502415	
R34	22K		502322	
R35	27K		502327	
R36	10meg		502610	
R37	560K		502456	
R38	100Ω		502210	
R39	68K	2	502368	
R40	100Ω		502210	
R41	12Ω		502062	
R42	330K		502433	
R43	470K		502447	
R44	150K		502415	
R45	220K		502422	
R46	470K		502447	
R47	150K		502415	
R48	390K		502439	Note 2
R49	47K		502347	Note 3
R50	270Ω		502327	
R51	680Ω		502268	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R52	33K		502333	
R53	10K	1	502310	
R54	2700Ω		502227	
R55	82K		502382	
R56	18K		502318	
R57	6.8meg		502568	
R58	1.2meg		502512	
R59	470K		502447	
R60	22K		502322	
R61	3900Ω		502239	
R62	680K		502468	
R63	470K		502447	
R64	18K		502318	
R65	8200Ω		502282	
R66	18K		502318	
R67	150Ω	1	512L5	
R68	220Ω	1	512L22	
R69	33000Ω		502333	
R70	150Ω			
R71	3.5Ω			
R72	150Ω			
R73	330K		502433	Note 2
R74	180K		502418	
R75	3300Ω		502233	
R76	820K		502427	
R77	56K		502356	
R78	68K	1	512368	
R79	820K		502482	
R80	1meg		502510	
R81	10meg		502610	
R82	10meg		502610	
R83	47Ω		502047	
R84	4700Ω	3	104635	
R85	100Ω	7	104188	
R86	68K		502368	
R87	220K		502422	
R88	100K		502410	
R89	4700Ω		502047	
R90	.39Ω		104181	
R91	1000Ω		502210	
R92	4700Ω	7	106074	
R93	820K		502482	
R94	9Ω		104295	
R95	2.2meg		502522	
R96	5800Ω	2	522268	

Note 1. Ch. KCS122AD, AE, M, N use 47K in this application (Part #502347).
Note 2. Some versions may use 560K in this application (Part #502456).
Note 3. Not used in Ch. KCS122A, B.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	104141					
L2	RF Choke						
L3	1st. Video IF	104140					
L4	Fil. Choke						
L5	2nd. Video IF	104139					
L6	Fil. Choke						
L7	3rd. Video IF	104138					
L8	4th. Video IF	104137					
L9	RF Choke	103639					18 Microhenries
L10	RF Choke	103639					18 Microhenries
L11	Shunt Peaking Coil	106757	19-3125	TV-196	6153	VP-4	130 Microhenries
L12	Series Peaking Coil	103631	19-3300 *	TV-199 *	6155 *		300 Microhenries, wound on 6800Ω resistor
L13	Shunt Peaking Coil	103637	19-4400	TV-201	6156	VP-7	390 Microhenries
L14	Shunt Peaking Coil	103643	19-3500 ▲	TV-186 ▲	6174 ▲	VP-8 ▲	510 Microhenries, wound on 1800Ω resistor
L15	4.5MC Trap	103638					Includes resistor
L16	1st. Sound IF	104136					Includes cap.
L17	2nd. Sound IF	104137	17-3489				Includes caps.
L18	Quadrature Coil	104138					
L19	RF Choke	76540	19-1001	BC-562	4804		1.5 Microhenries ①

* Parallel with 6800Ω resistor. ▲ Parallel with 1800Ω resistor. ① IRC Part #CL-1.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L20	79Ω		105667						Horiz. Freq. Coil Tapped ② 22Ω
L21	47Ω		102195						Horiz. Waveform Coil

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE @ CURRENT 1000 ~(.)	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L22	.240A	48Ω	9 Hy	100288			F-803		28C44 ①	C-24X

① Drill new mounting hole.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L23	Width Coil	106638								
A	(1.7-1.1MH)									
B	(1.08-1MH)									
	Alt. Width Coil	106220 ①								

① Used in early production models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	520VCT @ .240A	5V @ 3A	106062		P-2172 ①			26R47 ①	R-69BC ①
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 6.4A									

① Fabricate mounting.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	104085			V318				A-115X
T3	Yoke-Horiz. (8.6MH)	104078 ①	DF-613 ②		Y-111 ②		DY-26 ②	Y-47 ②	Y-60-2 ②
	(10°-Vert. (1.8MH)								
	Rear Cover & Centering Device	104460							
	Yoke Clamp	104409							
T4	Horiz. Output	106219	FB490 *	HVO-123 *	X166		HO-289 *	FLY-150 ③ *	D-139 *

① Includes R70, R71, R72, C75, C76 and C77.
② Use original rear cover and centering device.
③ Drill new mounting hole(s).

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5			5	5	5
4	4	4			4	4	4
3	3	3			3	3	3
2	2	2			2	2	2
1	1	1			1	1	1
Connect Width Coil Across →	2 & 1	2 & 1	2 & 1		2 & 1	2 & 1	2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7000Ω	3-4Ω	100037	21113 ①	A-3020	AU-802 ①	A-3878 ①	26S48	S-9Z	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP	REPLACEMENT DATA RCA Victor PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	3-4Ω	101182 ①	69A3	① Used in Models 21T9215, U, 9216, U, 9217, U, 9235, U,
	8"	PM	3-4Ω	74664 ②	8A2	9236, U, 9237, U, 9238, U, 9265, U, 9266, U, 9267, U,
	4" x 6"	PM	3-4Ω	104646 ③	46A15	9268, U, 9296, U, 9297, U, 9415, U, 9417, U
	4"	PM	3-4Ω	79696A ④	4A07	② Used in Models 21T9225, U, 9226, U, 9227, U, 9315, U,
	3 1/2"	PM	8-8Ω	102119 ⑤	3A15TZ9	9316, U, 9317, U, 9318, U, 9355, U, 9356, U, 9357, U
						③ Used in Models 21T9153, U, 9156, U, 9157, U,
						9355, U, 9356, U, 9357, U
						④ Used in Models 21T9132, U, 9136, U, 9137, U.
						⑤ Used in Models 21T9415, U, 9417, U.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No	REPLACEMENT DATA
K1	Sound IF Grid	56mmf, 47K	104329	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA RCA Victor PART No. FUSE	RCA Victor PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	#32AWG Copper Wire 2" Length							
M2	#28AWG Copper Wire 2" Length							
M3	#28AWG Copper Wire 2" Length							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M4	1N80	105517	1N90	1N295	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Tuner	KRK46T	VHF Ch. KCS122A, E, H
	Tuner	KRK46P	VHF Ch. KCS122F
	Tuner	KRK72A	VHF Ch. KCS122M, AD
	Tuner	KRK72B	VHF Ch. KCS122C, K
	Tuner	KRK47T	VHF With UHF Provisions, Ch. KCS122B, F, J
	Tuner	KRK47P	VHF Wth UHF Provisions, Ch. KCS122R
	Tuner	KRK73A	VHF With UHF Provisions, Ch. KCS122N, AE
	Tuner	KRK73B	VHF With UHF Provisions, Ch. KCS122D, L
	Tuner	KRK86A	UHF Ch. KCS122B, D, L, N, R, AE
	Tuner	KRK86J	UHF Ch. KCS122F, J
M6	Termal Switch	106542	
	Printed Board	106301	Video IF, Less Tubes
	Printed Board	104108A	Video, Sync, Less Tubes
	Printed Board	104518	Sound, Less Tubes
	Printed Board	106563	Sync, Vert., Less Tubes
	Printed Board	106160	Horiz., Less Tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	106275	Models 21T9225, 6, 7, & U, 21T9152, 5, 6, 7, & U, 21T9132, 5, 6, 7, & U
Safety Glass	106274	Models 21T9215, 6, 7, & U, 21T9235, 6, 7, 8, & U, 21T9255, 6, 7, 8, & U
Safety Glass	106521	Models 21T9315, 6, 7, 8, & U, 21T9415, 7, & U, 21T9355, 6, 7, & U, 21T9396, 7, & U
Safety Glass	106522	Models 21T9335, 7, 9, & U
Mask	[illegible]	Models 21T9355, 6, 7, & U, 21T9396, 7, & U, 21T9335, 7, 9, & U, 21T9315, 6, 7, 8, & U, 21T9415, 7, & U
Mask	106289	Models 21T9215, 6, 7, & U, 21T9225, 6, 7, 8, & U, 21T9255, 6, 7, 8, & U
Mask	106464	Models 21T9153, 5, 6, 7, & U, 21T9152, 5, 7, & U
Mask	106270	Models 21T9225, 6, 7, & U
Knob	106280	VHF Channel Selector, Models 21T9152, 5, 6, 7
Knob	106786	VHF Channel Selector, Models 21T9225, 6, 7
Knob	106097	VHF Channel Selector, Model 21T9132
Knob	106285	VHF Channel Selector, Models 21T9238, 21T9258, 21T9318
Knob	106096	VHF Channel Selector, Models 21T9216, 7, 21T9236, 7, 21T9256, 7, 21T9316, 7, 21T9417, 21T9137, 21T9337, 9
Knob	106095	VHF Channel Selector, Models 21T9215, 21T9235, 21T9135, 21T9255, 21T9315, 21T9415, 21T9335
Knob	106596	VHF Channel Selector, Models 21T9355, 6, 7, 21T9396, 7, 9, 21T9435, 6, 7
Knob	106599	VHF Channel Selector with UHF markings, Models 21T9355U, 6U, 7U, 21T9396U, 7U, 9U, 21T9435U, 6U, 7U
Knob	102580	UHF Channel Selector, Models 21T9132U, 21T9632U
Knob	102749	UHF Channel Selector, Models 21T9238U, 21T9258U, 21T9318U
Knob	102578	UHF Channel Selector, Models 21T9216U, 7U, 21T9236U, 7U, 21T9256U, 7U, 21T9316U, 7U, 21T9337U, 9U, 21T9417U, 21T9137U
Knob	102653	UHF Channel Selector, Models 21T9215U, 21T9235U, 21T9255U, 21T9335U, 21T9315U, 21T9415U, 21T9135U
Knob	106787	VHF-UHF Channel Selector, Models 21T9225U, 6U, 7U
Knob	106281	VHF-UHF Channel Selector, Models 21T9152U, 5U, 6U, 7U
Knob	106286	VHF-UHF Channel Selector, Models 21T9238U, 21T9258U, 21T9318U
Knob	106101	VHF-UHF Channel Selector, Model 21T9132U
Knob	106099	VHF-UHF Channel Selector, Models 21T9216U, 7U, 21T9337U, 9U, 21T9236U, 7U, 21T9256U, 7U, 21T9316U, 7U, 21T9417U, 21T9137U
Knob	106098	VHF-UHF Channel Selector, Models 21T9215U, 21T9235U, 21T9255U, 21T9315U, 21T9415U, 21T9135U, 21T9335U
Knob	106597	VHF-UHF Channel Selector, Models 21T9355U, 6U, 7U, 21T9396U, 7U, 9U, 21T9435U, 6U, 7U
Knob	106596	Fine Tuning, Models 21T9153, 5, 6, 7, & U, 21T9355, 6, 7, & U, 21T9396, 7, 9, & U, 21T9435, 6, 7, & U
Knob	101278	Fine Tuning, Models 21T9225, 6, 7, & U
Knob	104401	Fine Tuning, Models 21T9132, U
Knob	104399	Fine Tuning, Models 21T9238, U, 21T9258, U
Knob	106531	Fine Tuning, Models 21T9316, U
Knob	104398	Fine Tuning, Models 21T9216, 7, & U, 21T9236, 7, & U, 21T9256, 7, & U, 21T9337, U
Knob	106530	Fine Tuning, Models 21T9316, 7, & U, 21T9417, U, 21T9337, 9, & U

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D, E, F, H, J, K, L, M, N, P, R

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

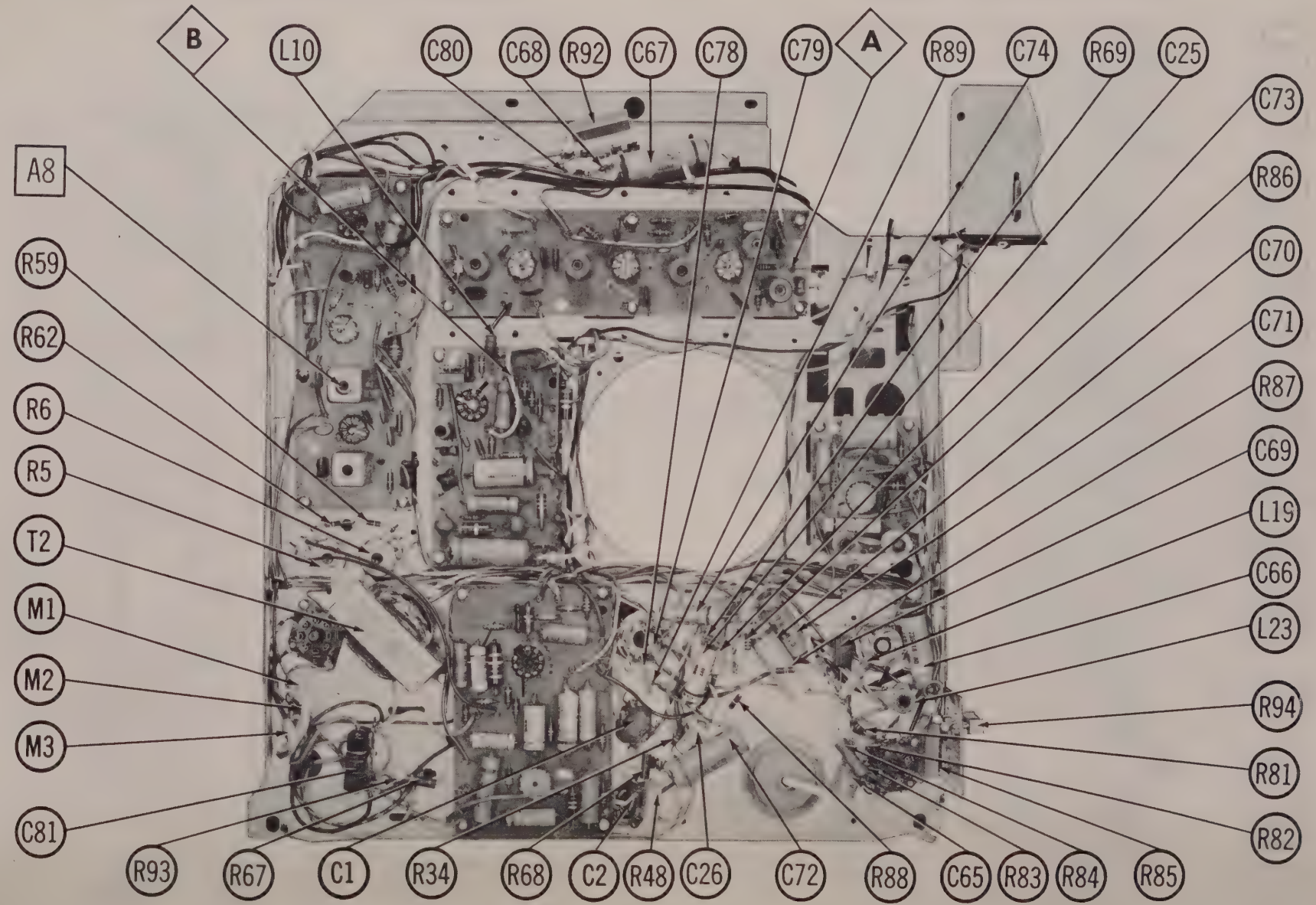
NAME	PART NO.	DESCRIPTION
Knob	104397	Fine Tuning, Models 21T9215, U, 21T9235, U, 21T9255, U, 21T9135, U
Knob	106529	Fine Tuning, Models 21T9315, U, 21T9415, U, 21T9335, U
Knob	106282	UHF Dial, Models 21T9225U, 6U, 7U, 21T9355U, 6U, 7U, 21T9152U, 5U, 6U, 7U, 21T9396U, 7U, 9U, 21T9435U, 6U, 7U
Knob	106103	UHF Dial, Models 21T9216U, 7U, 21T9236U, 7U, 8U, 21T9256U, 7U, 8U, 21T9316U, 7U, 8U, 21T9337U, 9U, 21T9417U
Knob	106104	UHF Dial, Model 21T9132U
Knob	106102	UHF Dial, Models 21T9215U, 21T9235U, 21T9255U, 21T9335U, 21T9315U, 21T9415U, 21T9135U
Knob	101144B	UHF Tuning, Models 21T9435U, 6U, 7U, 21T9225U, 6U, 7U, 21T9152U, 5U, 6U, 7U, 21T9355U, 6U, 7U, 21T9396U, 7U, 9U
Knob	106278	Volume, Models 21T9225, 6, 7, & U, 21T9152, 5, 6, 7, & U, 21T9355, 6, 7, &U, 21T9396, 7, 9, & U, 21T9435, 6, 7, & U
Knob	106094	Volume, Models 21T9132, U
Knob	106284	Volume, Models 21T9238, U, 21T9318, U, 21T9258, U
Knob	106100	Volume, Models 21T9216, 7, & U, 21T9236, 7, & U, 21T9256, 7, & U, 21T9316, 7, & U, 21T9337, 9, & U, 21T9417, U, 21T9137, U
Knob	106093	Volume, Models 21T9215, U, 21T9235, U, 21T9255, U, 21T9335, U, 21T9315, U, 21T9415, U, 21T9135, U
Knob	106279	Brightness, Vert. Hold, Tone, Models 21T9225, 6, 7, & U, 21T9152, 5, 6, 7, & U, 21T9435, 6, 7, & U
Knob	102581	Brightness, Vert. Hold, Tone, Models 21T9215, 6, 7, & U, 21T9235, 6, 7, 8, & U, 21T9255, 6, 7, 8, & U, 21T9315, 6, 7, 8, & U, 21T9355, 6, 7, & U, 21T9396, 7, 9, & U, 21T9415, 7, & U, 21T9132, 5, 6, & U
Knob	106277	Contrast, Models 21T9225, 6, 7, & U, 21T9152, 5, 6, 7, & U, 21T9355, 6, 7, & U, 21T9396, 7, 9, & U, 21T9435, 6, 7, & U
Knob	106092	Contrast, Models 21T9132, U
Knob	106283	Contrast, Models 21T9238, U, 21T9258, U, 21T9318, U
Knob	106091	Contrast, Models 21T9216, 7, & U, 21T9236, 7, & U, 21T9256, 7, & U, 21T9316, U, 21T9337, 9, & U, 21T9317, U, 21T9417, U, 21T9137, U
Knob	106090	Contrast, Models 21T9215, U, 21T9235, U, 21T9255, U, 21T9335, U, 21T9315, U, 21T9415, U, 21T9135, U
Knob	106575	Clock Dial, Models 21T9225, 6, 7, & U
Knob	101811	Clock Time Set, Models 21T9255, 6, 7, & U
Cabinet	Z4445	Models 21T9132, U
Cabinet	Z4446	Models 21T9135, U
Cabinet	Z4447	Models 21T9137, U
Cabinet	Z4415	Models 21T9152, U
Cabinet	Z4416	Models 21T9155, U
Cabinet	Z4417	Models 21T9156, U
Cabinet	Z4418	Models 21T9157, U
Cabinet	M4351	Models 21T9215, U
Cabinet	M4352	Models 21T9216, U
Cabinet	M4353	Models 21T9217, U
Cabinet	M4439	Models 21T9225
Cabinet	M4440	Models 21T9225U
Cabinet	M4441	Model 21T9226
Cabinet	M4442	Model 21T9226U
Cabinet	M4443	Model 21T9227
Cabinet	M4444	Model 21T9227U
Cabinet	M4391	Models 21T9235, U
Cabinet	M4392	Models 21T9236, U
Cabinet	M4393	Models 21T9237, U
Cabinet	M4394	Models 21T9238, U
Cabinet	M4395	Models 21T9255, U
Cabinet	M4396	Models 21T9256, U
Cabinet	M4397	Models 21T9257, U
Cabinet	M4398	Models 21T9258, U
Cabinet	X4475	Models 21T9335, U
Cabinet	X4476	Models 21T9337, U
Cabinet	X4477	Models 21T9339, U
Cabinet	M4399	Model 21T9355
Cabinet	M4400	Model 21T9355U
Cabinet	M4401	Model 21T9356
Cabinet	M4402	Model 21T9356U
Cabinet	M4403	Model 21T9357
Cabinet	M4404	Model 21T9357U
Cabinet	X4405	Model 21T9396
Cabinet	X4406	Model 21T9396U
Cabinet	X4407	Model 21T9397
Cabinet	X4408	Model 21T9397U
Cabinet	X4437	Model 21T9399
Cabinet	X4438	Model 21T9399U
Cabinet	M4409	Model 21T9315, U
Cabinet	M4410	Models 21T9316, U
Cabinet	M4411	Models 21T9317, U
Cabinet	M4412	Models 21T9318, U
Cabinet	M4413	Models 21T9415, U
Cabinet	M4414	Models 21T9417, U
Cabinet	M4478	Model 21T9435
Cabinet	M4479	Model 21T9435U
Cabinet	M4480	Model 21T9436
Cabinet	M4481	Model 21T9436U
Cabinet	M4482	Model 21T9437
Cabinet	M4483	Model 21T9437U
Leg	X5023	Models 21T9225, U
Leg	X5024	Models 21T9226, U
Leg	X5025	Models 21T9227, U
Leg	X3985	Models 21T9235, U, 21T9255, U
Leg	X3986	Models 21T9236, U, 21T9256, U
Leg	X3987	Models 21T9237, U, 21T9257, U
Leg	X3988	Models 21T9238, U, 21T9258, U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

SOUND PRINTED BOARD

SYNC & VERT PRINTED BOARD



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
Set Contrast Control fully clockwise.
Set VTVM for negative voltage readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (400∿ FM Mod. 15KC Swp)	Any non-interfering channel	DC probe thru diode detector (Fig. 7) to pin 7 (grid 3) of 6DT6 (V6). Common to chassis.	A7, A8, A9	Adjust for maximum negative DC on meter. Attenuate generator output for a reading between 1 and 1.5 volts on meter when finally peaked. Peak A7 and A8 with maximum core separation. Adjust A9 for maximum.
11.	"	"	"	"	USE SCOPE. Connect across volume control.	A10	Adjust for maximum 400∿ indication on scope. Adjust volume control for .7 volt peak to peak on scope when peaked.
12.	"	"	"	"	"		Decrease input signal to MINIMUM usable level and retouch A7, A8 and A9 for symmetrical breakout similar to Fig. 8.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	.01mfd	High side to point (B). Low side to chassis.	Not used	4.5MC (400∿ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector probe to pin 7 (cathode) of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ indication on scope.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 8 & 21

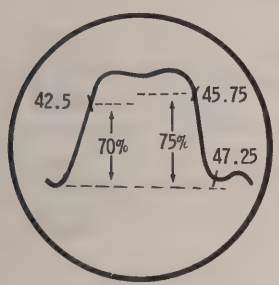


FIG.1

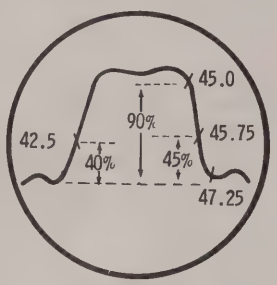


FIG.2

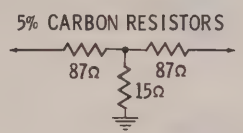


FIG.3

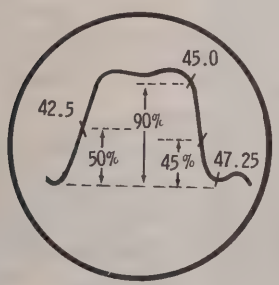


FIG.4

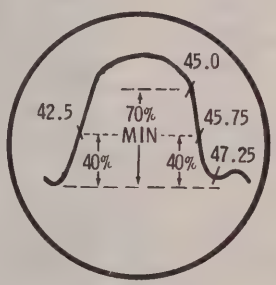


FIG.5

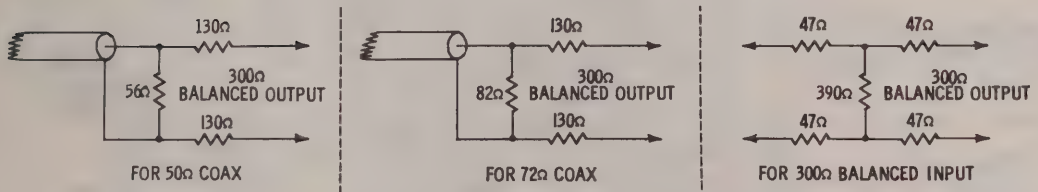


FIG.6

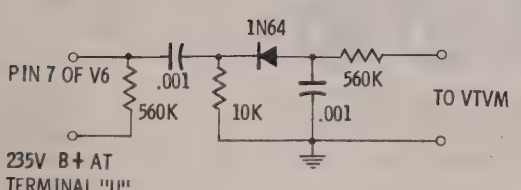


FIG.7

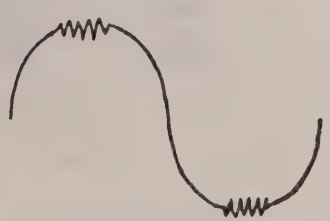
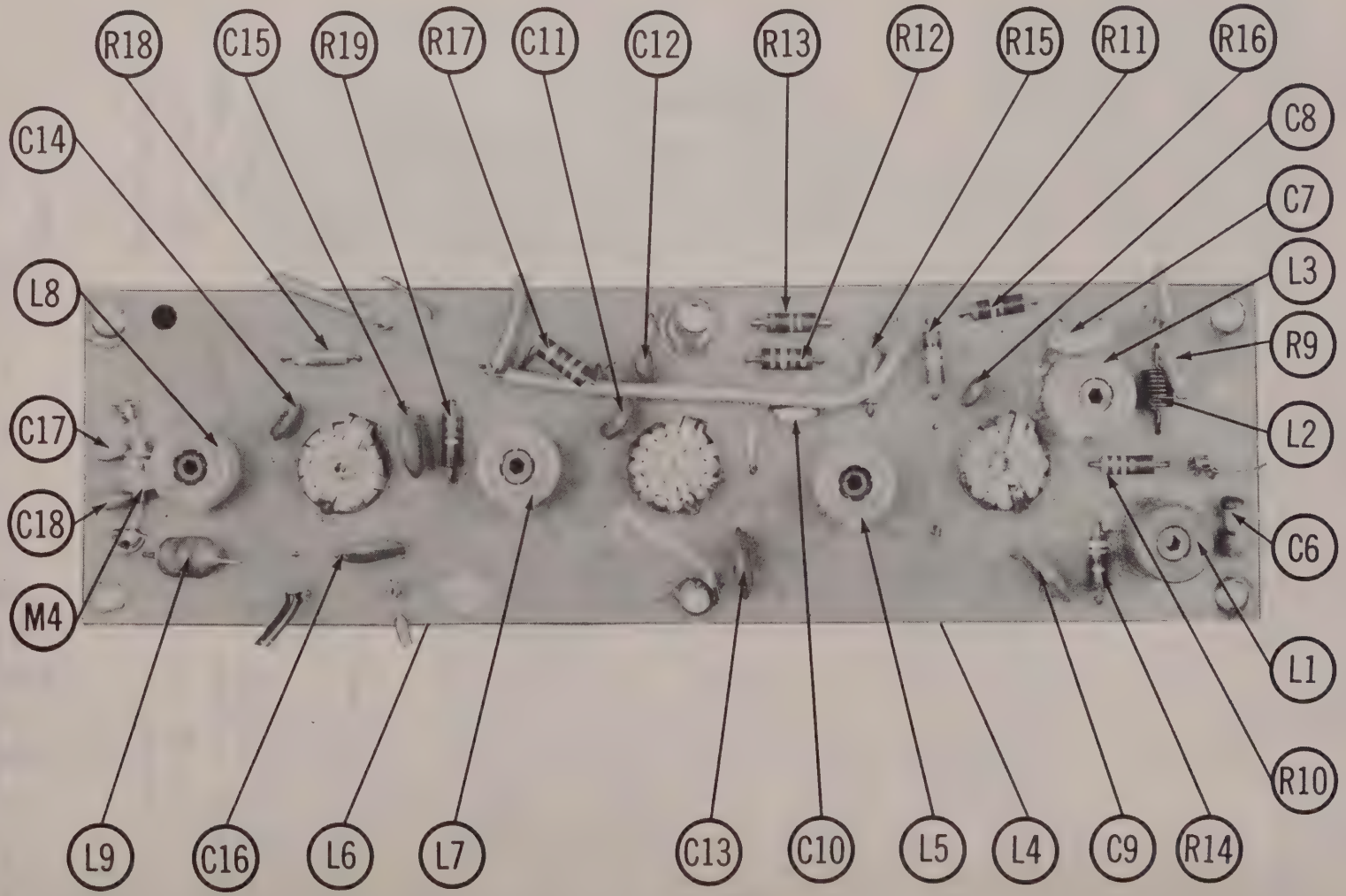


FIG. 8



VIDEO IF PRINTED BOARD

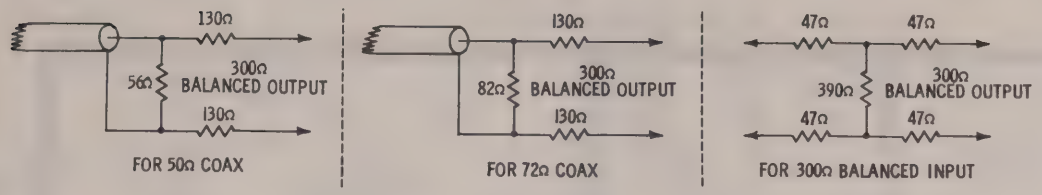


FIG. 201

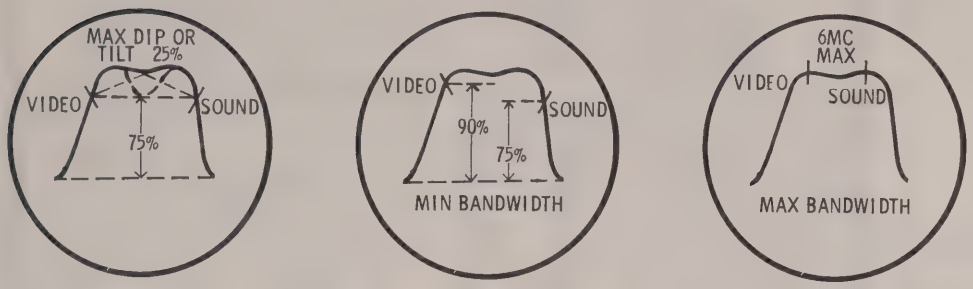


FIG. 202

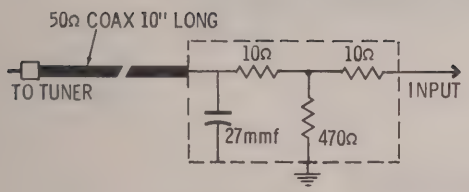


FIG. 203

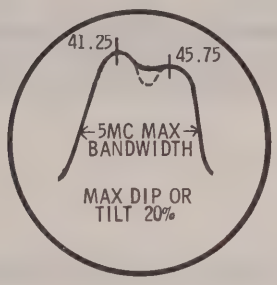


FIG. 204

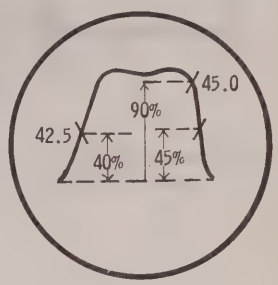
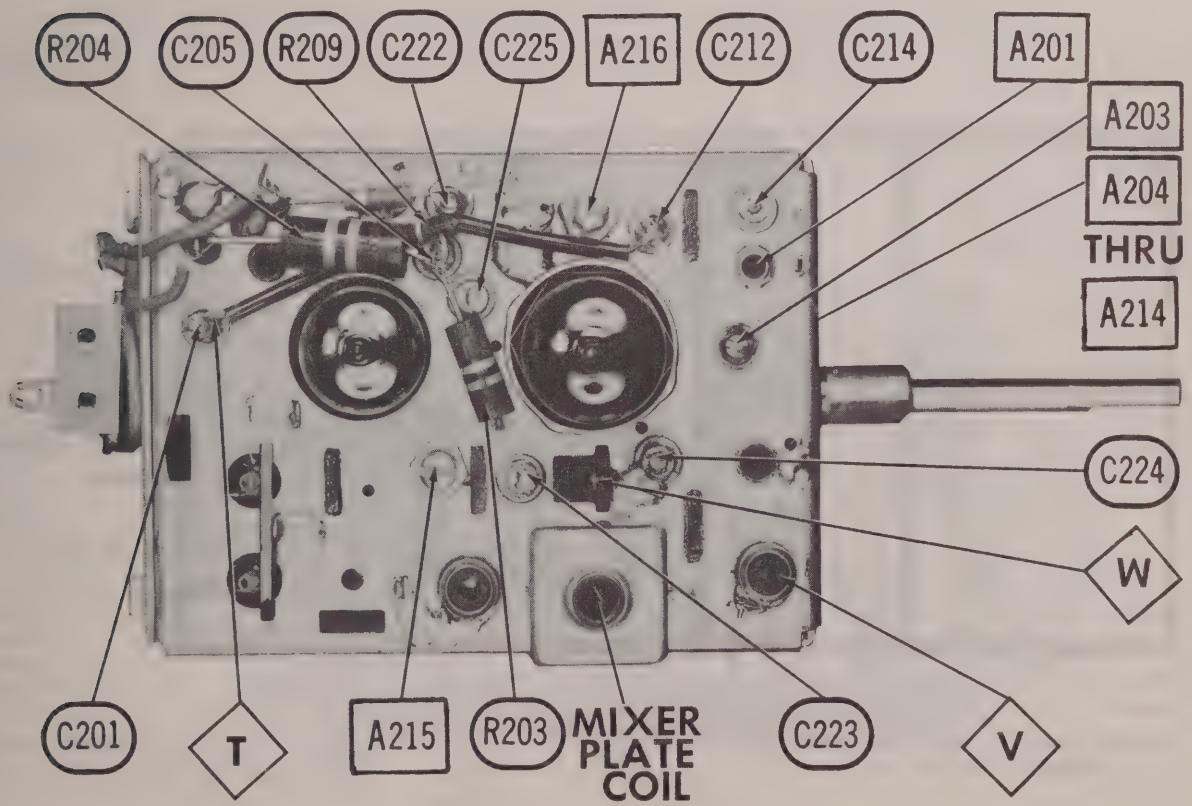
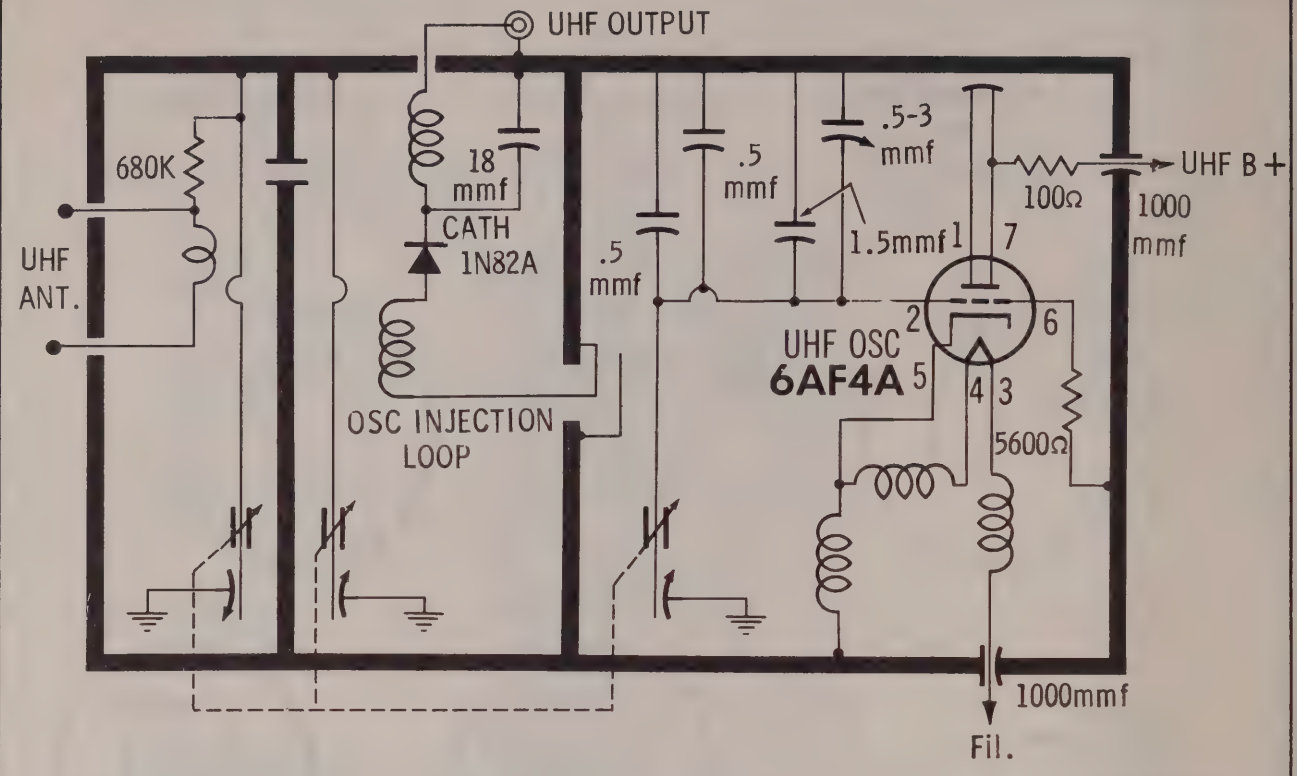


FIG. 205



UHF TUNER KRK 66A



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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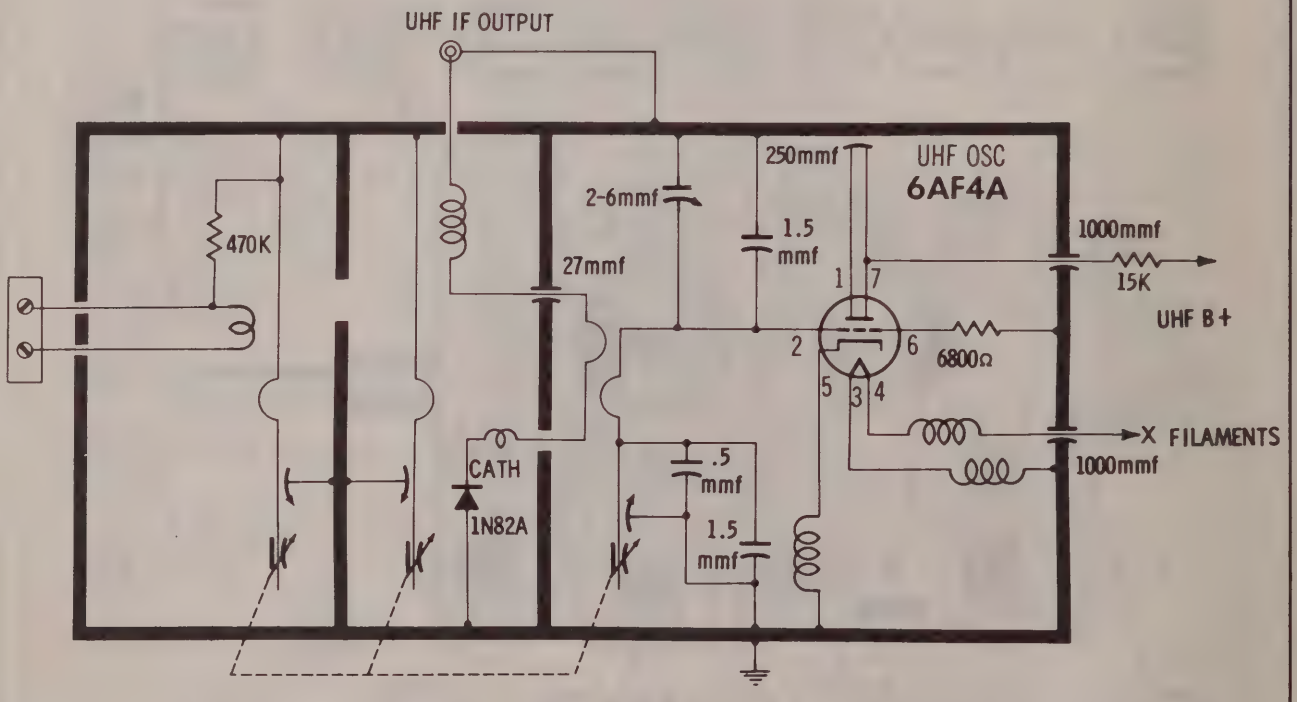
UHF TUNER KRK66A, J



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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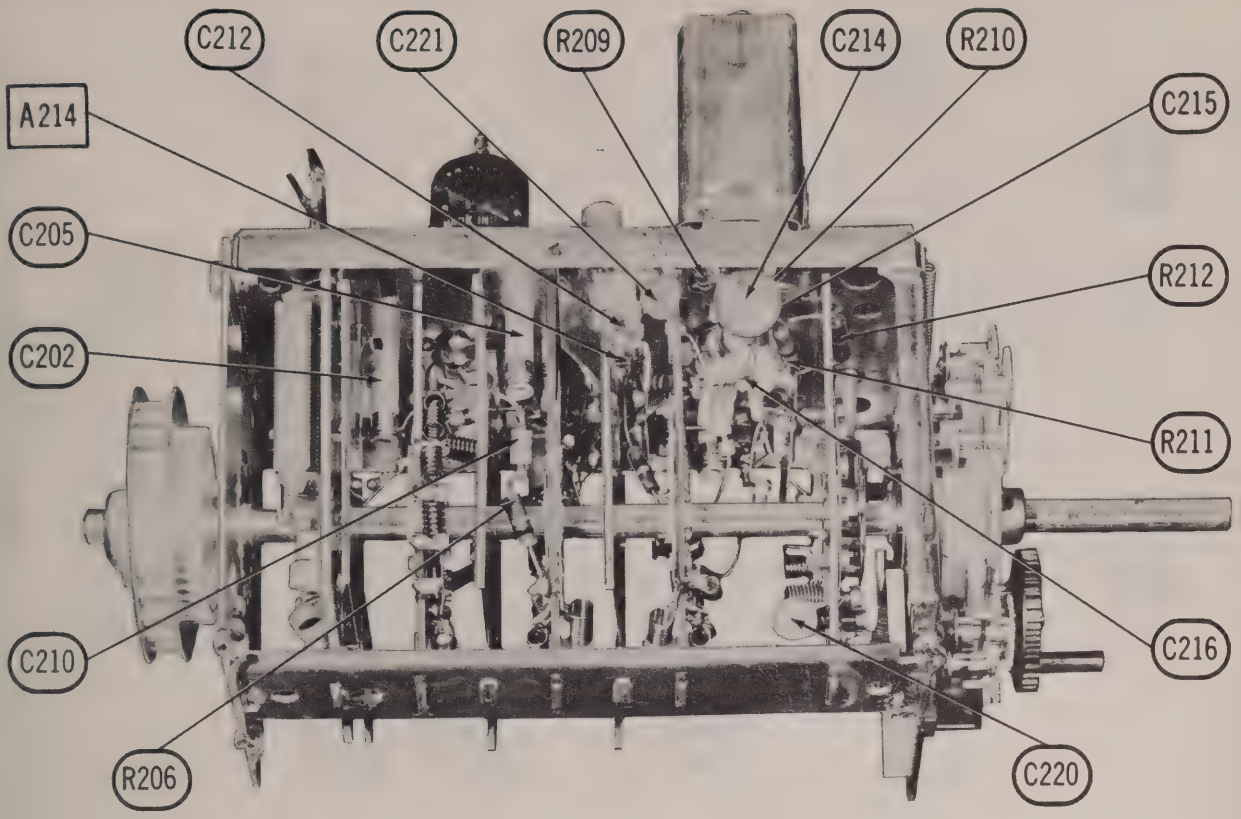
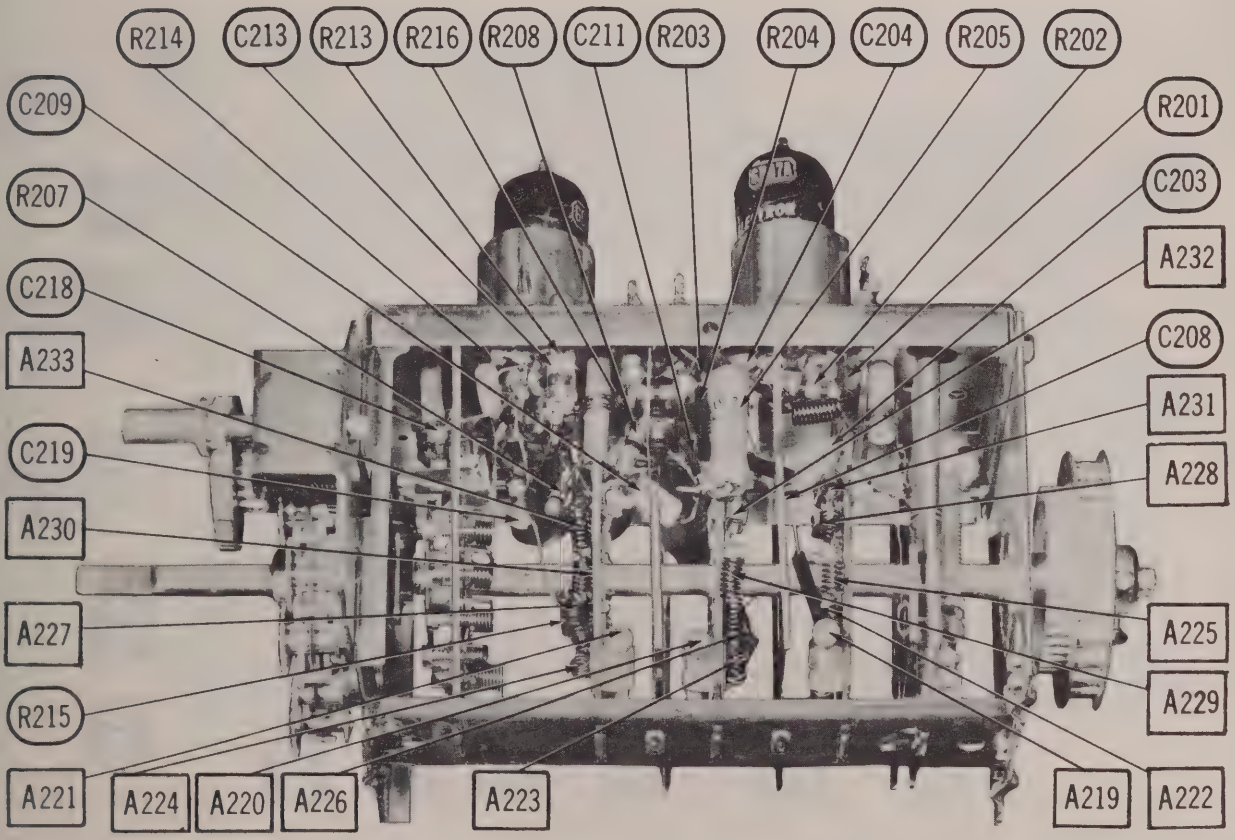
ALTERNATE CIRCUIT UHF TUNER KRK66A, J



TUNER KRK46T - LEFT SIDE

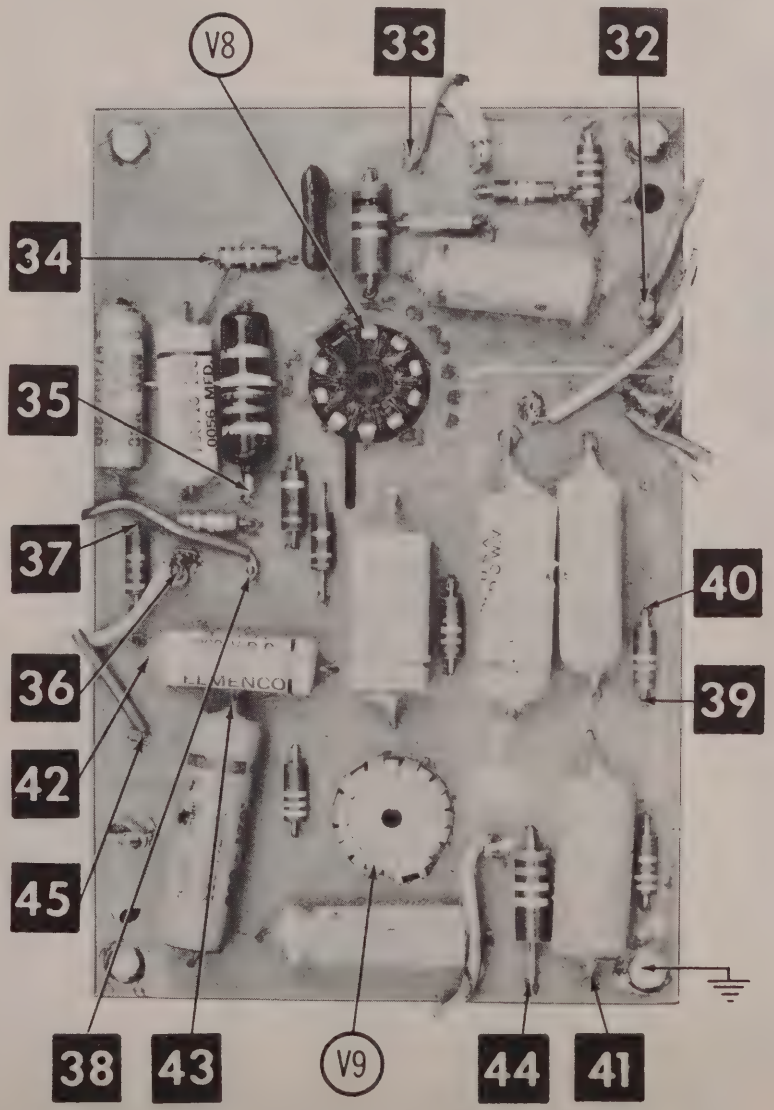


TUNER KRK46T - RIGHT SIDE

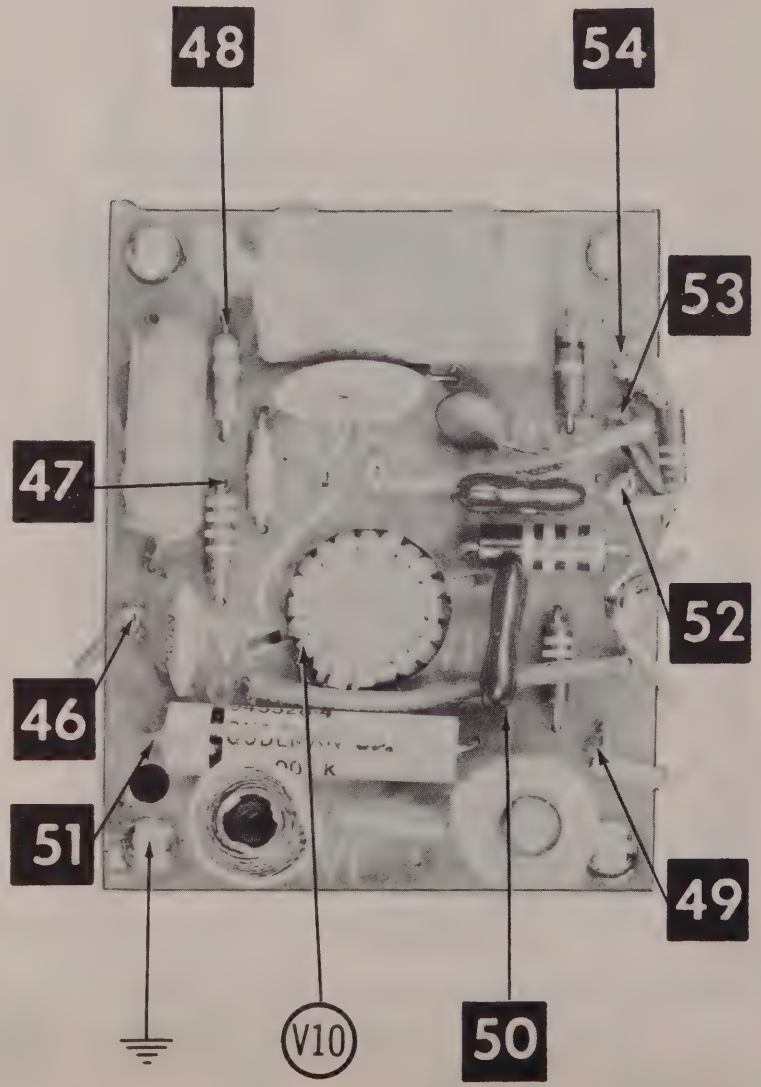
CircuiTrace Numbers 32 thru 45

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 46 thru 54



SYNC & VERT
PRINTED BOARD



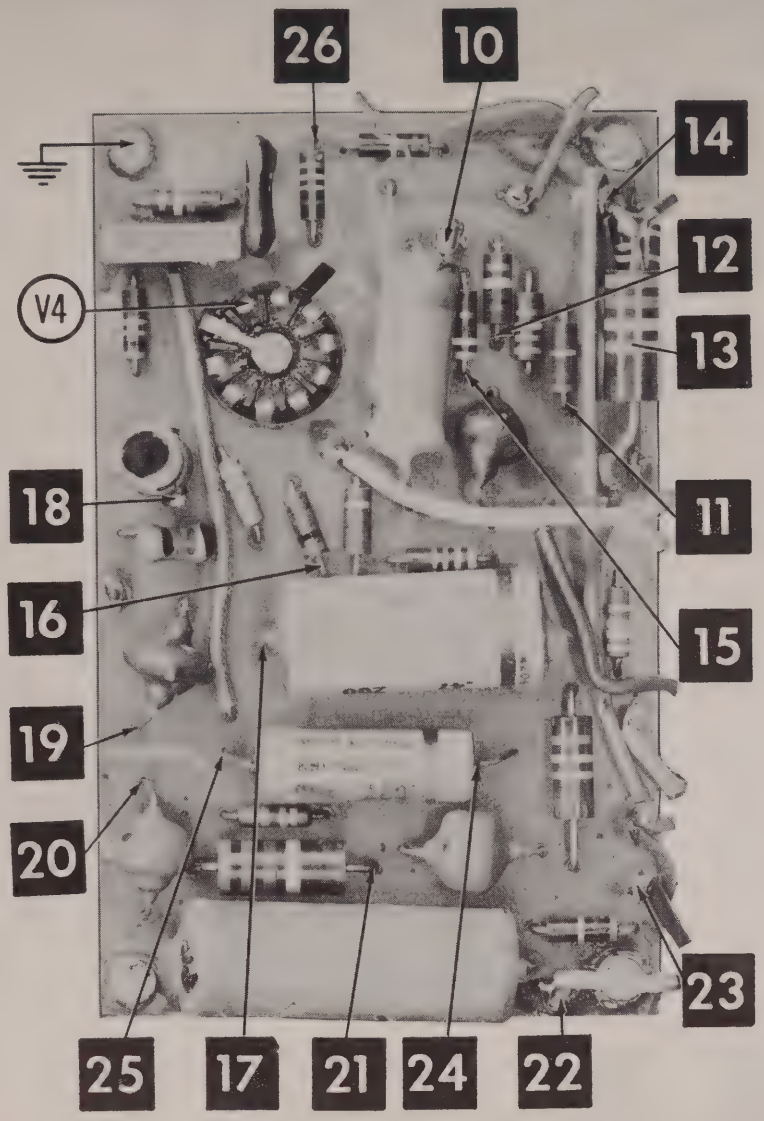
HORIZ
PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

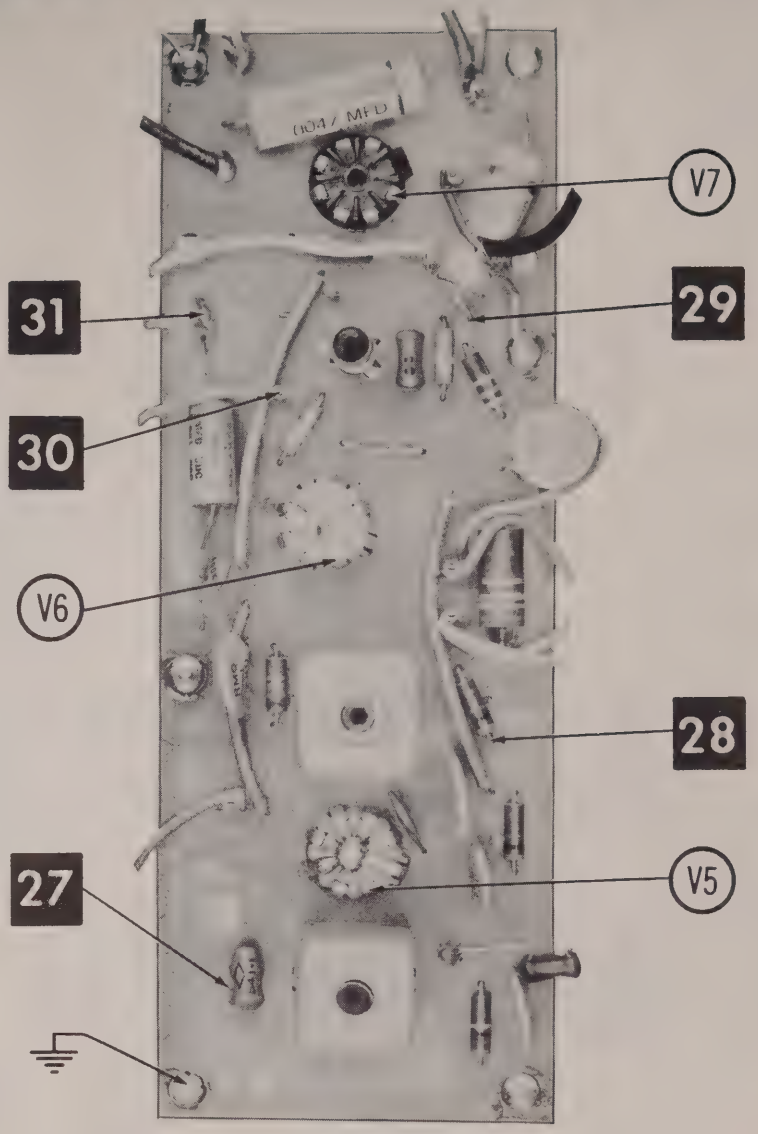
CircuiTrace Numbers 10 thru 26

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 27 thru 31



VIDEO & SYNC
PRINTED BOARD



SOUND
PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

RCA VICTOR CHASSIS KCS122A, AD, AE, B, C, D,
E, F, H, J, K, L, M, N, P, R

FOLDER 3

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CF6	450K	47Ω	0Ω	.1Ω	††680Ω	††680Ω	0Ω		
V2	6CB6	††12K	¶	0Ω	.1Ω	†680Ω	†680Ω	¶		
V3	6CB6	0Ω	180Ω	.1Ω	0Ω	†470Ω	†470Ω	0Ω		
V4	6AW8A	0Ω	2.4meg	†390K	.1Ω	0Ω	• 130Ω	1meg	†56K	†6800Ω
V5	6AU6	47K	0Ω	0Ω	.1Ω	†5700Ω	†19K	82Ω		
V6	6DT6	4.2Ω	560Ω	.1Ω	0Ω	‡560K	†18K	470K		
V7	6DS5	0Ω	270Ω	.1Ω	0Ω	†2100Ω	†1800Ω	0Ω		
V8	6CG7	†17K	28K	0Ω	0Ω	.1Ω	• ‡1.7meg	• 2.3meg	0Ω	0Ω
V9	6CZ5	†150Ω	NC	• 1.4meg	0Ω	.1Ω	• 1.4meg	0Ω	NC	†620Ω
V10	6CG7	†0Ω	• 650K	• 490K	0Ω	.1Ω	†68K	• 70K	69Ω	0Ω
V11	6DQ6A	NC	0Ω	NC	†4700Ω	1meg	TP	.1Ω	100Ω	TOP CAP ‡16Ω
V12	6AU4GTA	NC	NC	¶	NC	†.6Ω	NC	0Ω	.1Ω	
V13	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡400Ω
V14	5U4GB	NC	¶	NC	24Ω	NC	25Ω	NC	¶	
V15	21CEP4	0Ω	22K	‡290K	†0Ω	NC	NC	• 190K	.1Ω	
V201	6BQ7A	†1300Ω	450K	550K	0Ω	.1Ω	550K	1.1meg	0Ω	0Ω
V202	6CQ8	†370Ω	75K	INF	.2Ω	.1Ω	INF	0Ω	INF	INF
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

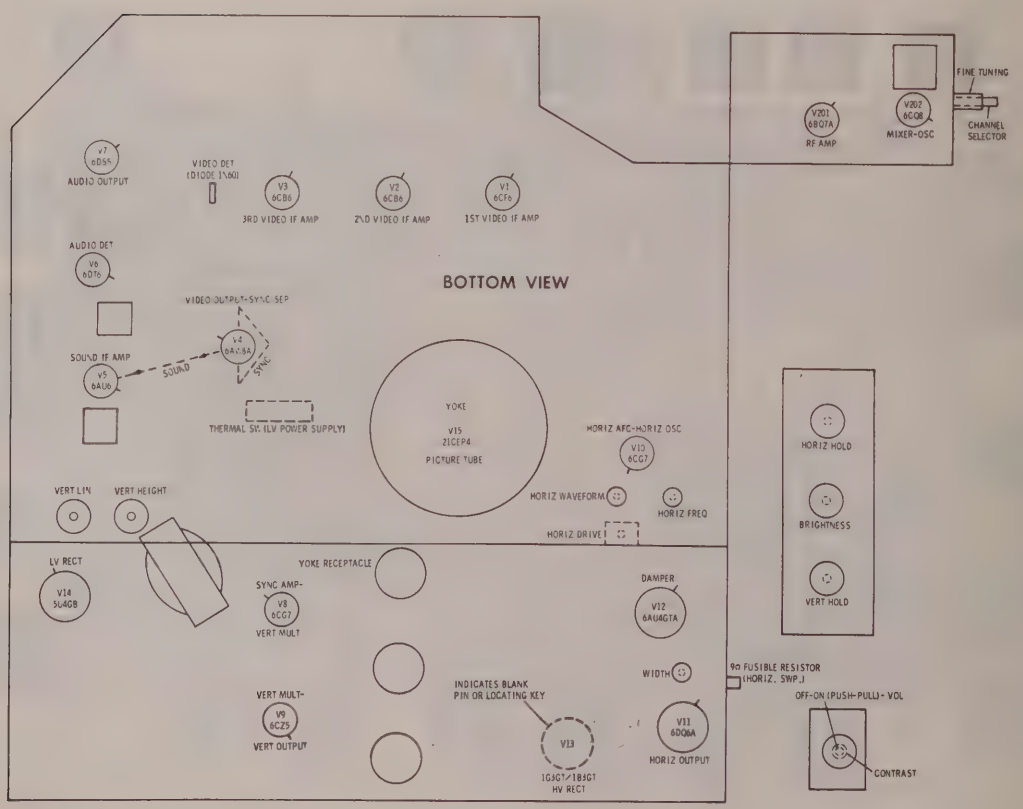
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

†† MEASURED FROM PIN 7 OF V2.

† MEASURED FROM 250V SOURCE. NC NO CONNECTION.

‡ MEASURED FROM PIN 3 OF V12. TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder

EIA

DAVID BOGEN
MODELS K15, K15Y

DAVID BOGEN
MODELS K15, K15Y

MODEL K15

DAVID BOGEN
MODELS K15, K15Y

TRADE NAME	David Bogen Models K15, K15/Y
MANUFACTURER	David Bogen Co., P.O. Box 500, Paramus, N.Y.
TYPE SET	AC Operated 15 Watt Audio Amplifier (Model K15/Y Has 3 Speed Manual Record Player)
TUBES (Six)	Types 12AX7 Mic Preamplifier, 6AV6 1st AF Amplifier, 12AX7 2nd AF Amp.-Phase Inv., (2) 6L6GB Output, 6AX5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .795 Amp. @ 117 Volts AC (80 Watts)

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H666

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic Pre Amplifier	12AX7	
V2	1st AF Amplifier	6AV6	
V3	2nd AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V4	Output	6L6GB	
V5	Output	6L6GB	
V6	Rectifier	6AX5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DAVID BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲10	450		AFH2-47	D0080	WP433.6	TMQ-9	Q-027	R1508 *
B	▲10	450							
C2A	▲5	450		AFH4-09	D0080	WP433.6	TMQ-9	Q-027	TVL-4759.7
B	■5	450							
C	5	450							
D	▲5	450							
C3	50	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308

* Non-Catalog Item

FIXED CAPACITORS

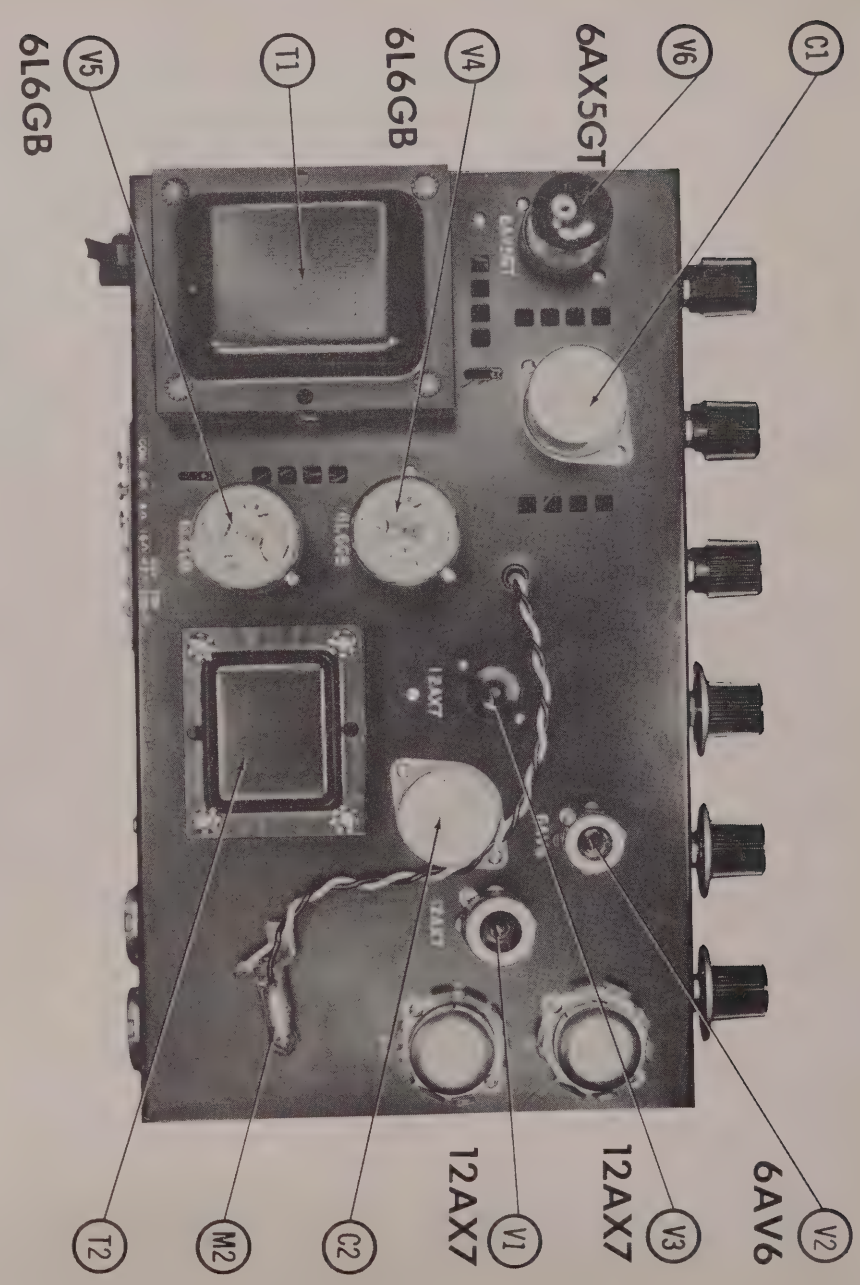
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	DAVID BOGEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	15000			BPD-015	DD16-153	BYA10S15		5HK-S15	
C5	15000			BPD-015	DD16-153	BYA10S15		5HK-S15	
C6	.033	400		P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C7	.033	400		P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C8	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C9	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	820					IR5T82		MS-382	10%
C11	1500					IR5D15		MS-215	10%
C12	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C13	.033	400		P488N-033	DF-303	CYB4S33	GEM-4133	4TM-S33	
C14	.033	400		P488N-033	DF-303	CUB4S33	GEM-4133	4TM-S33	
C15	620					IR5T62		MS-362	5%
C16	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	DAVID BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	MIC 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	MIC 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1.5meg	½	V407	B-76	A47-2meg-[illegible]	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	•
R5A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less. unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	DAVID BOGEN PART No.	NOTES
R6	3.3meg			
R7	220K			
R8	3.3meg			
R9	220K			
R10	220K			
R11	470K			
R12	100K			
R13	220K			
R14	220K			
R15	2200Ω			
R16	150K			
R17	2200Ω			
R18	220K			
R19	220K			
R20	2200Ω			
R21	47K			
R22	470K			
R23	12K			
R24	47K			
R25	470K			
R26	250Ω	7(WW)		
R27	10K			
R28	1000Ω	2		
R29	4.7Ω	1		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA DAVID BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .795A	640VCT @.110A	6.3VCT @4 A	T-3152						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA DAVID BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5200Ω CT	326Ω Taps@ 42Ω 16Ω 8Ω 4Ω	T-2127							

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA DAVID BOGEN PART No. FUSE	DAVID BOGEN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1½A. 125V S/B			31301.5 (3AG 1½A. 125V S/B	342001	MDX 1½	HKP

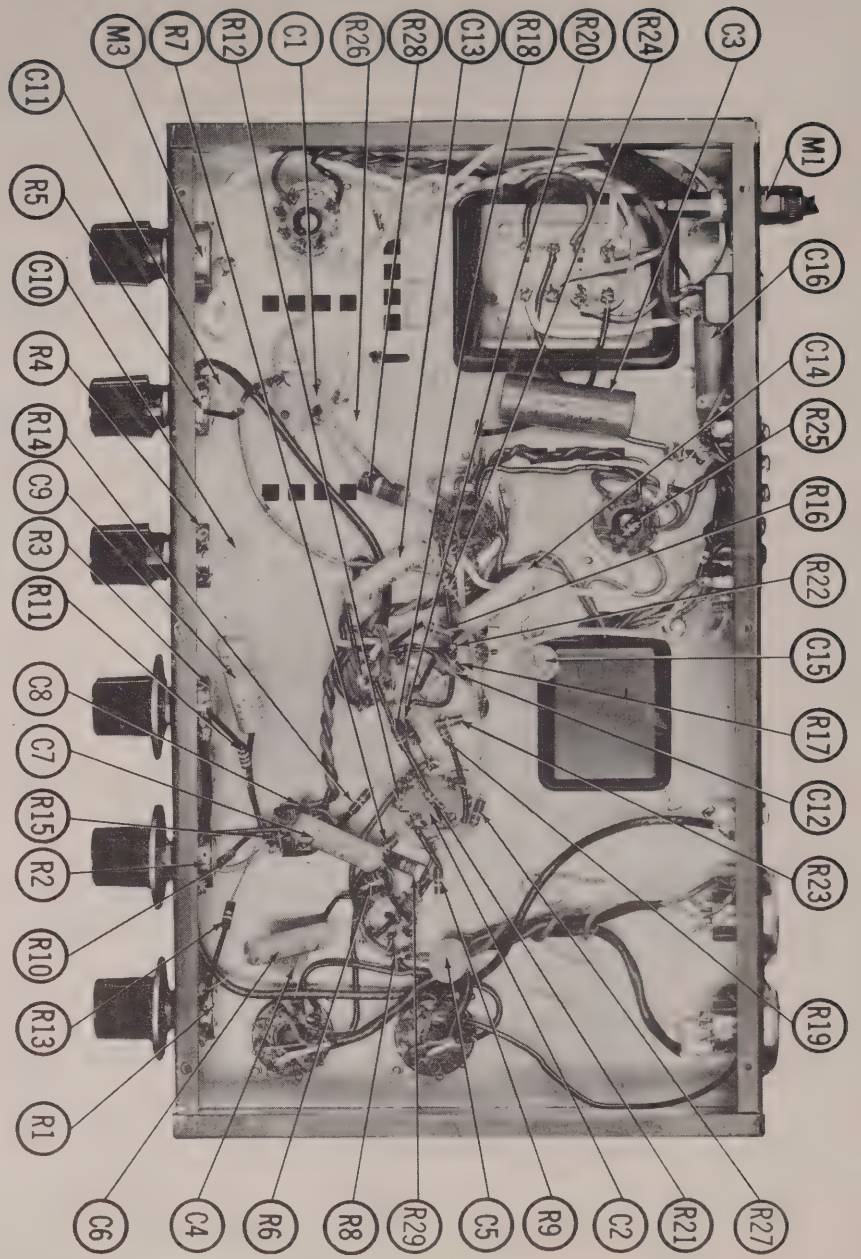
MISCELLANEOUS

ITEM No.	PART NAME	DAVID BOGEN PART No.	NOTES
M2	Lamp		#51
M3	Switch	S434	Power On-Off Rotary Snap

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW

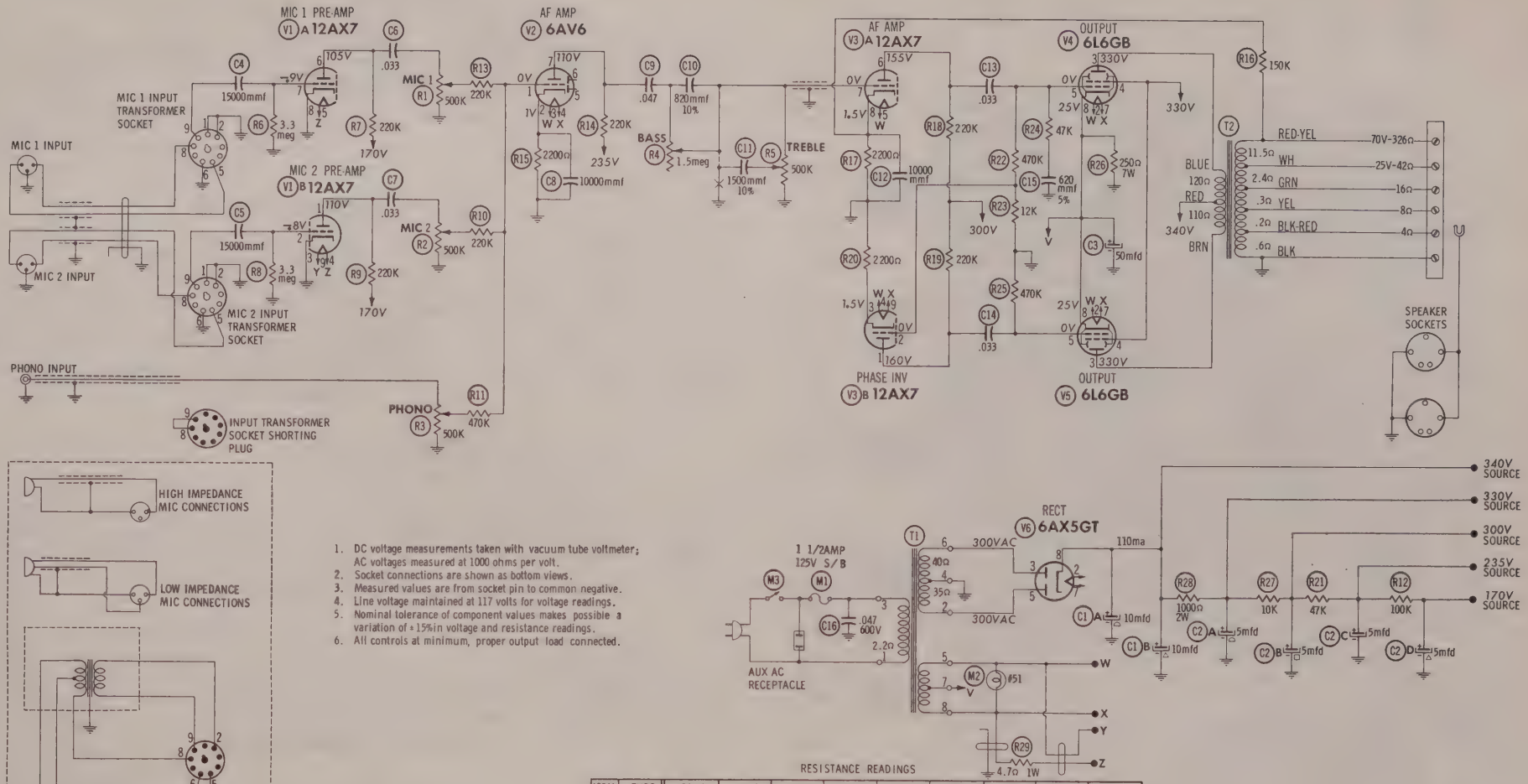


DAVID BOGEN
MODELS K15, K15Y

SET 420 FOLDER 4

DAVID BOGEN
MODELS K15, K15Y

FOLDER 4



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†370K	3.3meg	0Ω	250Ω	250Ω	†370K	3.3meg	0Ω	250Ω
V2	6AV6	80K	2200Ω	250Ω	250Ω	NC	NC	†275K		
V3	12AX7 ECC83	†230K	12K	2200Ω	250Ω	250Ω	†230K	500K	2200Ω	250Ω
V4	6L6GB	TP	250Ω	†120Ω	†1000Ω	480K	TP	250Ω	250Ω	
V5	6L6GB	TP	250Ω	†110Ω	†1000Ω	470K	NC	250Ω	250Ω	
V6	6AX5 GT	NC	250Ω	40Ω	NC	36Ω	NC	250Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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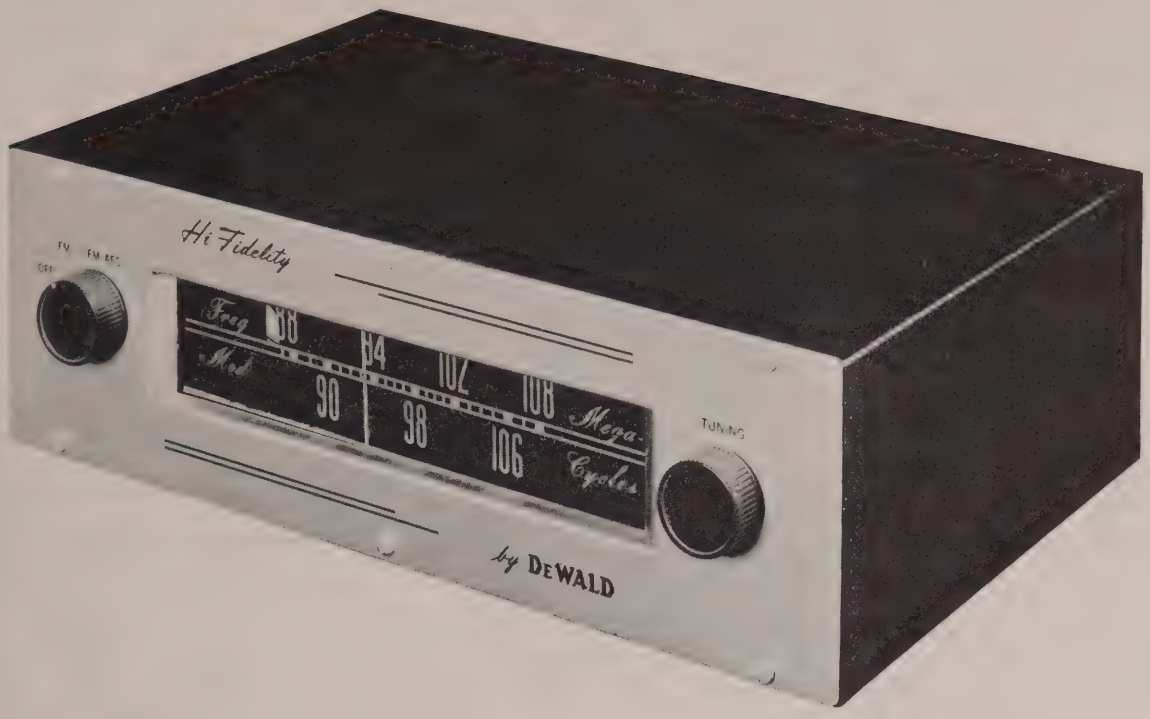
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DEWALD MODEL M-804

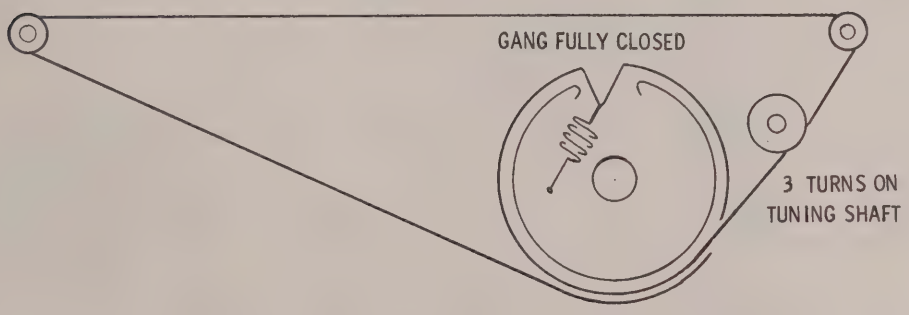
DEWALD MODEL M-804



DEWALD MODEL M-804

TRADE NAME	DeWald Model M-804
MANUFACTURER	DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated FM Tuner
TUBES (Seven)	Types 6U8A RF Amp. - Mixer, 12AT7 Osc. - AFC, 6BA6 1st IF Amplifier, 6AU6 2nd IF Amplifier, 6AU6 Limiter, 6AL5 Discriminator, EM80/6BR5 Tuning Indicator
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .285 Amp. @ 117 Volts AC (26 Watts)
TUNING RANGE - FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



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H682

SET 420 FOLDER 5

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	200mmf	High side to RF stator lug of tuning gang. Low side to chassis.	10. 7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for maximum deflection.
2.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

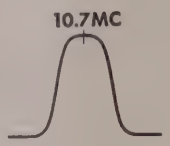


FIG. 1

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

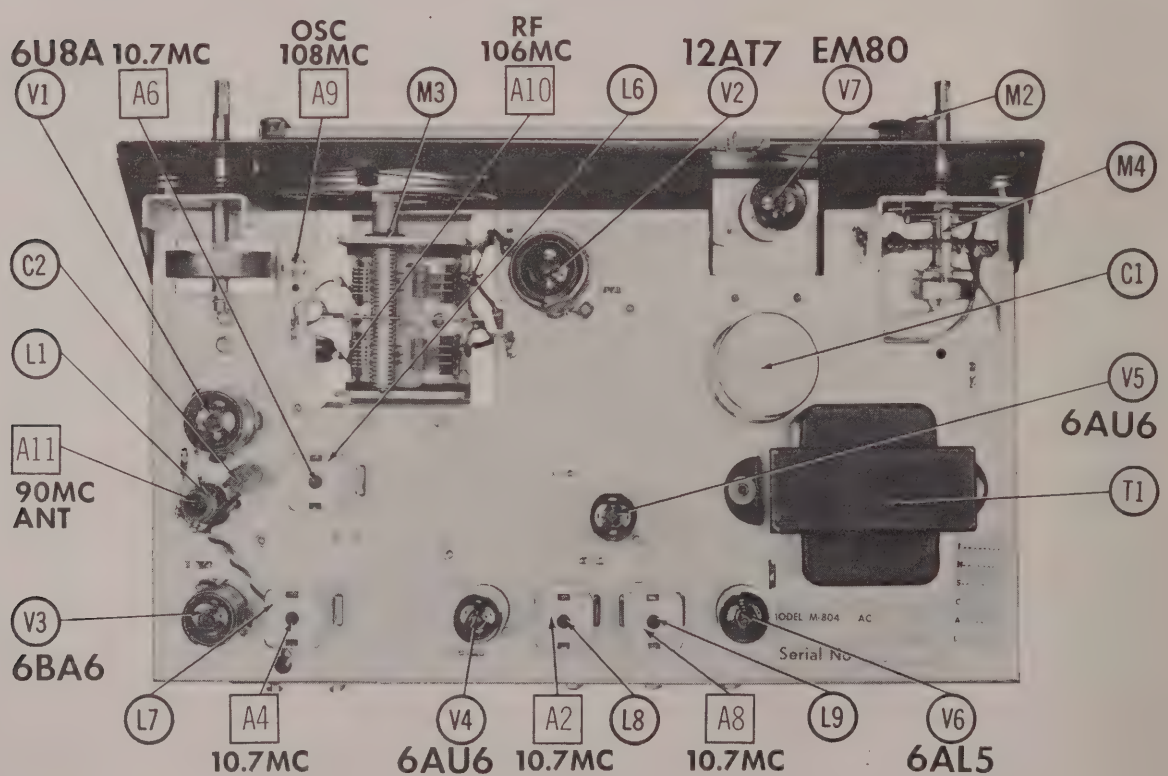
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	200mmf	High side to RF stator lug of tuning gang. Low side to chassis.	10. 7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 1meg res. to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. thru 1meg res. to point (B). Low side to chassis.	A8	Adjust so that 10. 7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

FIG. 2

RF ALIGNMENT

Disconnect line cord antenna.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	270Ω Carbon Resistor	High side thru 270Ω antenna terminal. Low side to chassis.	108MC (Unmod.)	FM	108MC	DC probe thru 1meg res. to point (A). Common to chassis.	A9	Adjust for maximum deflection.
4.	"	"	106MC	"	Tune to 106MC signal	"	A10	"
5.	"	"	90MC	"	Tune to 90MC signal	"	A11	"



CHASSIS —TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp. - Mixer	6U8A	
V2	Osc. - AFC	12AT7	
V3	1st IF Amplifier	6BA6	
V4	2nd IF Amplifier	6AU6	
V5	Limiter	6AU6	
V6	Discriminator	6AL5	
V7	Tuning Indicator	EM80/6BR5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	200	E-212-4	AFH4-02	D0020	FP320	TMQ-3	T-085	R2677 *
B	■40	200				TC55		MT-4530	
C	▲20	200							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100			N750-DI 100	DTN-100	C10T1U	NT531	5TCU-T1	N750
C3	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C4	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C6	220			BPD-00022	DD-220	L10T22	UC-5322	5GA-T22	
C7	100			N750-DI 100	DTN-100	C10T1U	NT531	5TCU-T1	N750
C8	2.2			NPO-SI 2.2	TCZ-2R2	CTA6V22C			
C9	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C10	100			N750-DI 100	DTN-100	C10T1U	NT531	5TCU-T1	N750
C11	10			N750-DI 10	DTN-10	C10Q1U	NT541	5TCU-Q1	N750
C12	68			NPO-SI 68	TCZ-68	CTA6Q68C		5TCC-Q68	NPO
C13									
C14	910					L10T91			
C15	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C16	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C17	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C18	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C19	.05	200		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C20	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C21	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C22	100			N750-DI 100	DTN-100	C10T1U	NT531	5TCU-T1	N750
C23	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C24	47			DI 47	DD-470	L10Q47	UC-5447	5GA-Q47	
C25	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C26	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C27	100			N750-DI 100	DTN-100	C10T1U	NT531	5TCU-T1	N750
C28	470			BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C29	330			BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C30	.05	200		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C31	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	DEWALD PART No.	NOTES
R1	270K			
R2	220Ω			
R3	68Ω			
R4	2.2meg			
R5	15K			
R6	22K			
R7	10K			
R8	100Ω			
R9	470K			
R10	47K			
R11	1meg			
R12	560Ω			
R13	2.2meg			
R14	1000Ω			
R15	220K			
R16	1000Ω			
R17	100K			
R18	10K			

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	DEWALD PART No.	NOTES
R19	1000Ω			
R20	15K			
R21	100K			
R22	100K			
R23	33K			
R24	33K			
R25	2.2meg			
R26	390K			
R27	390Ω	1		
R28	390Ω	1		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA DEWALD PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	1102B-4					
L2	RF Choke	1104-4		SW-631 *			4.7 Microhenries; wound on a 10K Resistor
L3	FM RF Coil	1100-3					
L4	RF Choke	1104-3	19-1002	SW-630	4606		2.7 Microhenries
L5	FM Osc. Coil	0-156-5					
L6	1st FM IF	1038B-5	16-3487	FM-254	1463		
L7	2nd FM IF	1038B-5	16-3487	FM-254	1463		
L8	3rd FM IF	1038B-5	16-3487	FM-254	1463		
L9	Discriminator	1038B-2	17-3494	FM-253	1464		

* Parallel with 10K Resistor.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA DEWALD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ②.28A	120V ②.040A Tap ③ 6.3V ③ 2.3A		PT157A	P9102	P3045		PA8421	26R38	R-30X

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA DEWALD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.04A	8018B-3	1234AH	T065	65A K200 ①	① Silicon

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M2	Dial Lamp		#47
M3	Tuning Cap.	V222B-3	2 Gang
M4	Switch	8089-6	Selector, 3 Pole, 3 Position Single Wafer, Rotary

CABINETS & CABINET PARTS

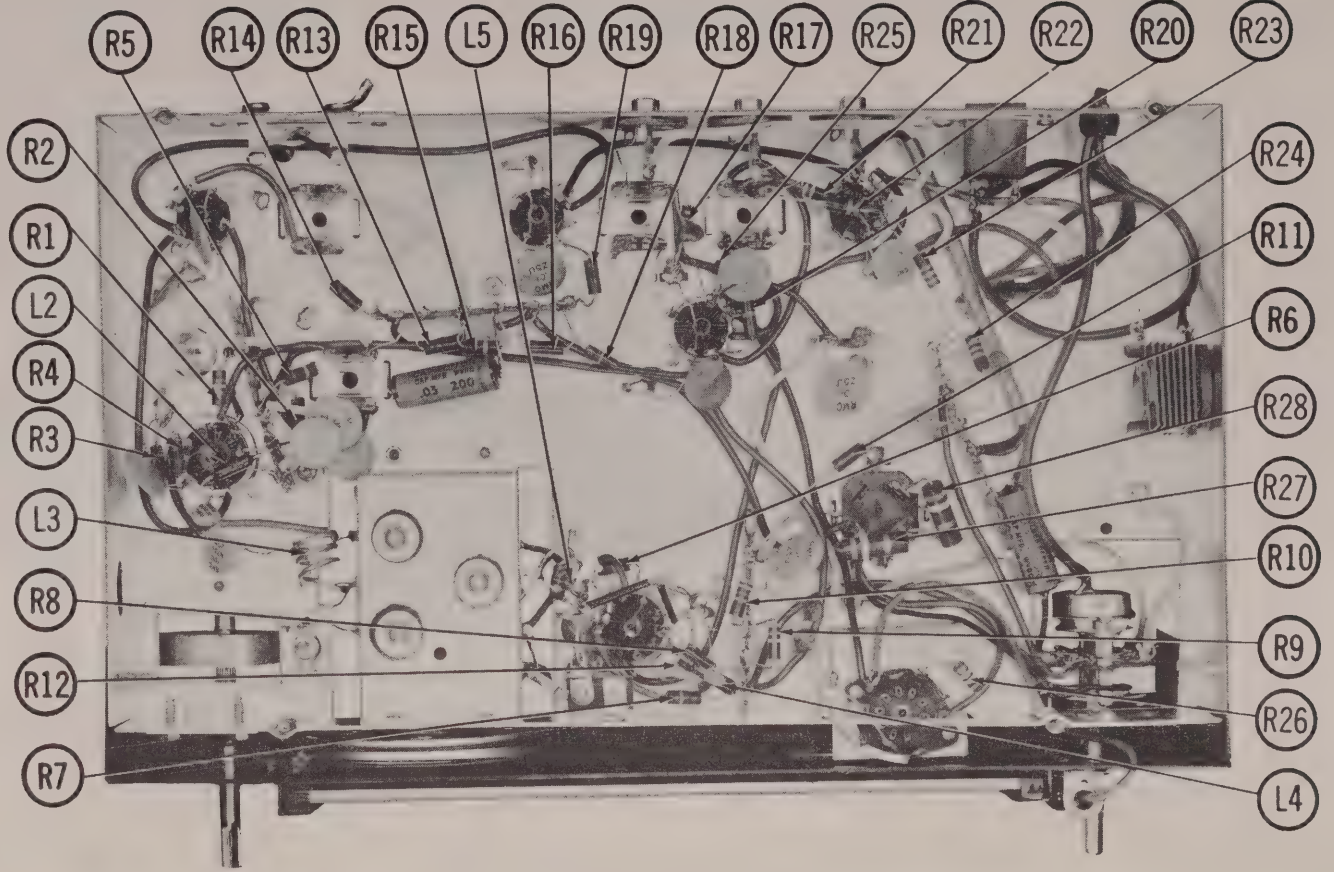
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	K472-7	Tuning
Knob	K472-6	Selector
Dial Scale	DG-607	

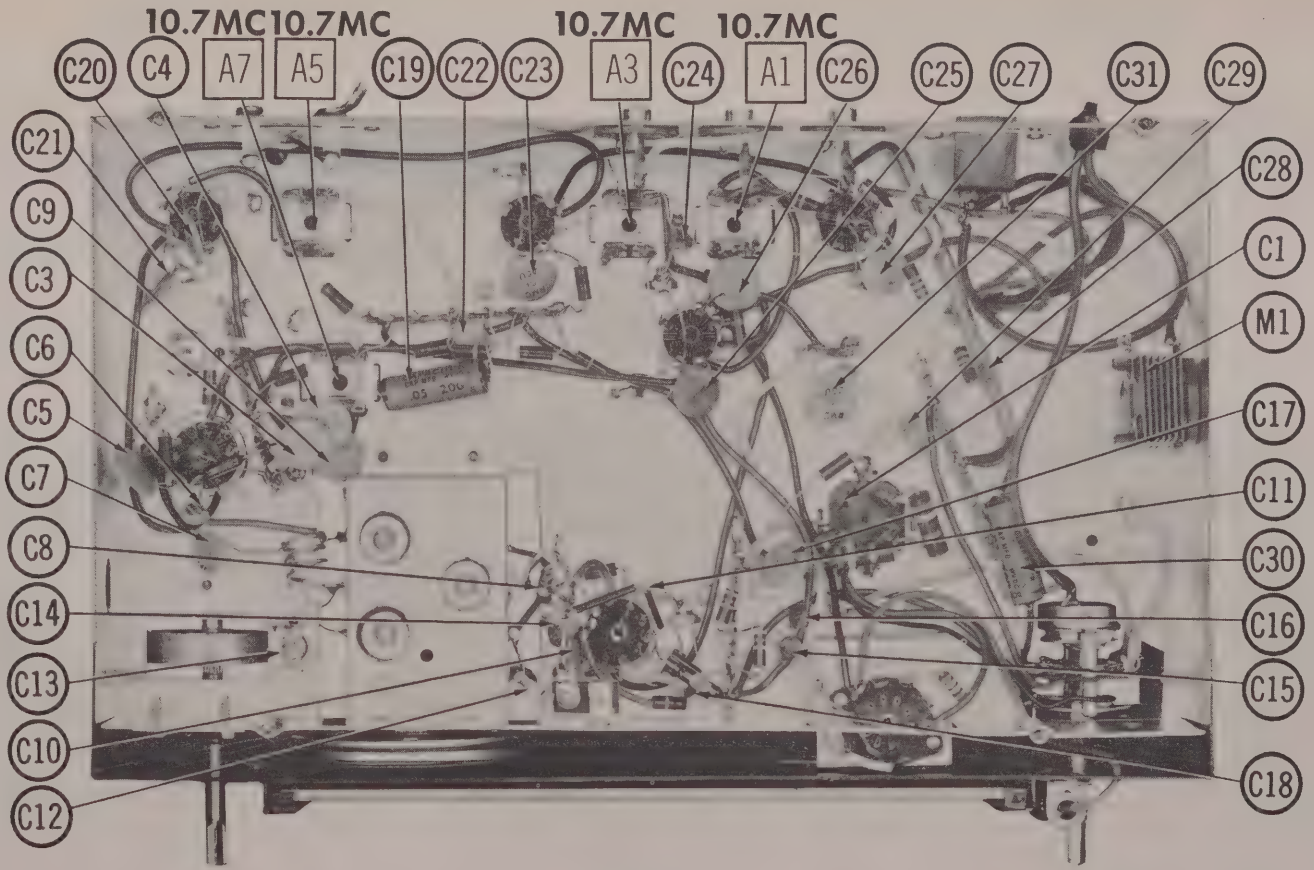
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

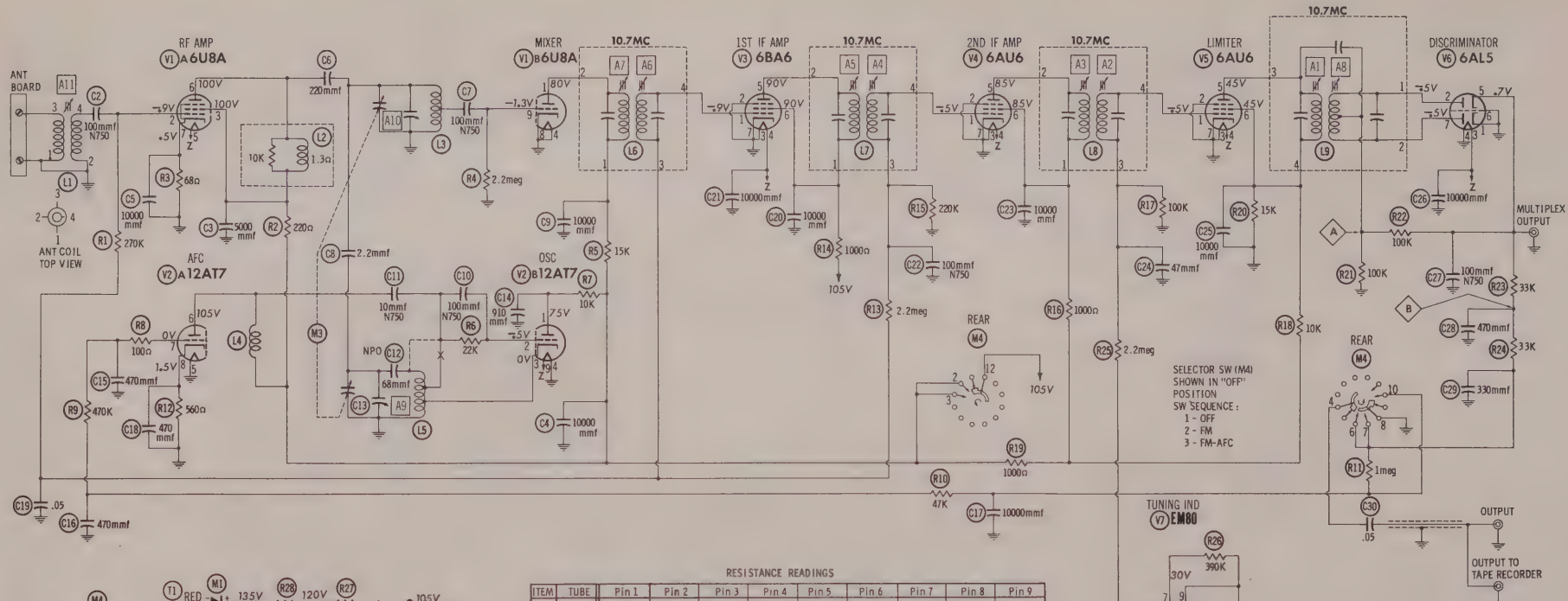
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

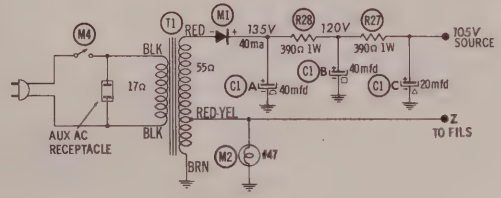


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW - ALIGN, CAPACITOR & MISC IDENT





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8A	†15K	2.7meg	†1000Ω	0Ω	.1Ω	†1000Ω	68Ω	0Ω	2.2meg
V2	12AT7	†11K	22K	0Ω	0Ω	0Ω	†800Ω	520K	560Ω	.1Ω
V3	6BA6	2.4meg	0Ω	0Ω	.1Ω	†1800Ω	†1800Ω	0Ω		
V4	6AU6	220K	0Ω	0Ω	.1Ω	†2800Ω	†2800Ω	0Ω		
V5	6AU6	100K	0Ω	0Ω	.1Ω	†9000Ω	†9000Ω	0Ω		
V6	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		
V7	6BR5 EM80	2.3meg	0Ω	†800Ω	0Ω	.1Ω	NC	†390K	NC	†800Ω

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

OLYMPIC-OPTA MODELS
52804, 52805 "Verona"

OLYMPIC-OPTA MODELS
52804, 52805 "Verona"

MODEL 52804

OLYMPIC-OPTA MODELS
52804, 52805 "Verona"

TRADE NAME	Olympic-Opta Models 52804, 52805 "Verona"
MANUFACTURER	Olympic Radio And Tel. Corp., 34-01 38th Ave., Long Island City 1, N.Y.
TYPE SET	AC Operated FM-BC-SW Receiver With 4 Speed Automatic Record Changer
TUBES (Seven)	Types ECC85/6AQ8 FM RF Amp.-FM Conv., ECH81/6AJ8 1st FM IF Amp.-AM Mixer-AM Osc., EF89/6DA6 2nd FM-1st AM IF Amp., EABC80/6T8 Ratio Det.-AM Det.-AVC-AF Amp., EM80/6BR5 Tuning Indicator, ECL82/6BM8 AF Amp.-Output, ECL82/6BM8 Phase Inv.-Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .52 Amp. @117 Volts AC (53 Watts Less Phono)
TUNING RANGES	BROADCAST 535-1630KC FREQ. MOD. 88-108MC SHORT WAVE 5.9-19.5MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE PERPETUUM - EBNER REX AA - PHOTOFACT SET 378 FOLDER 10.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H652

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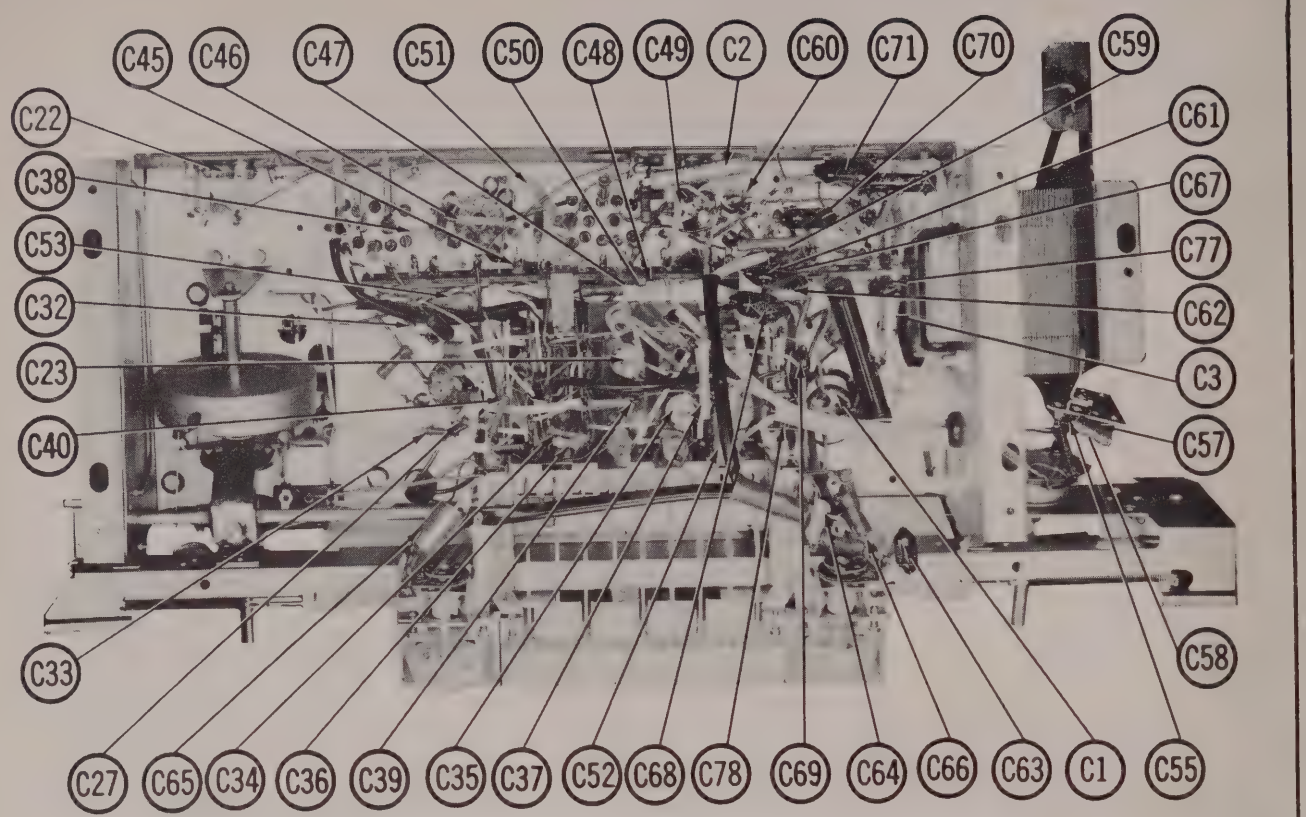
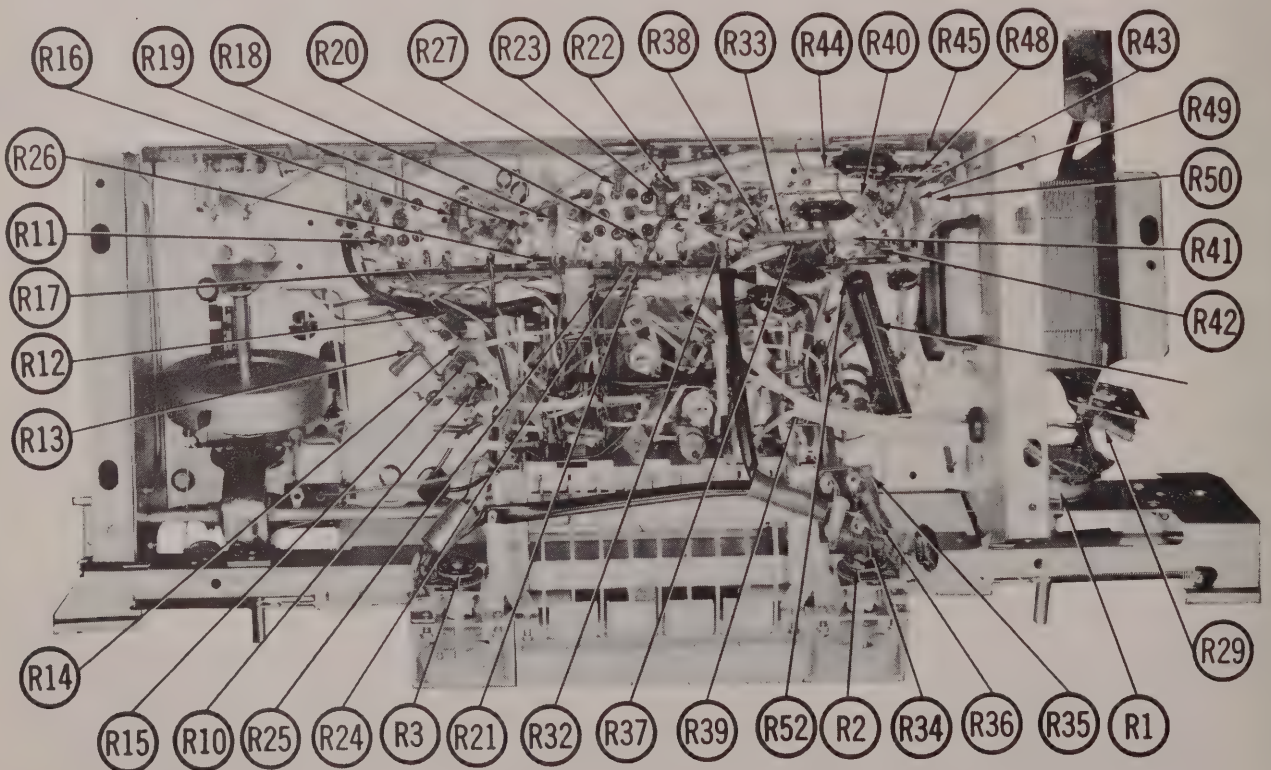
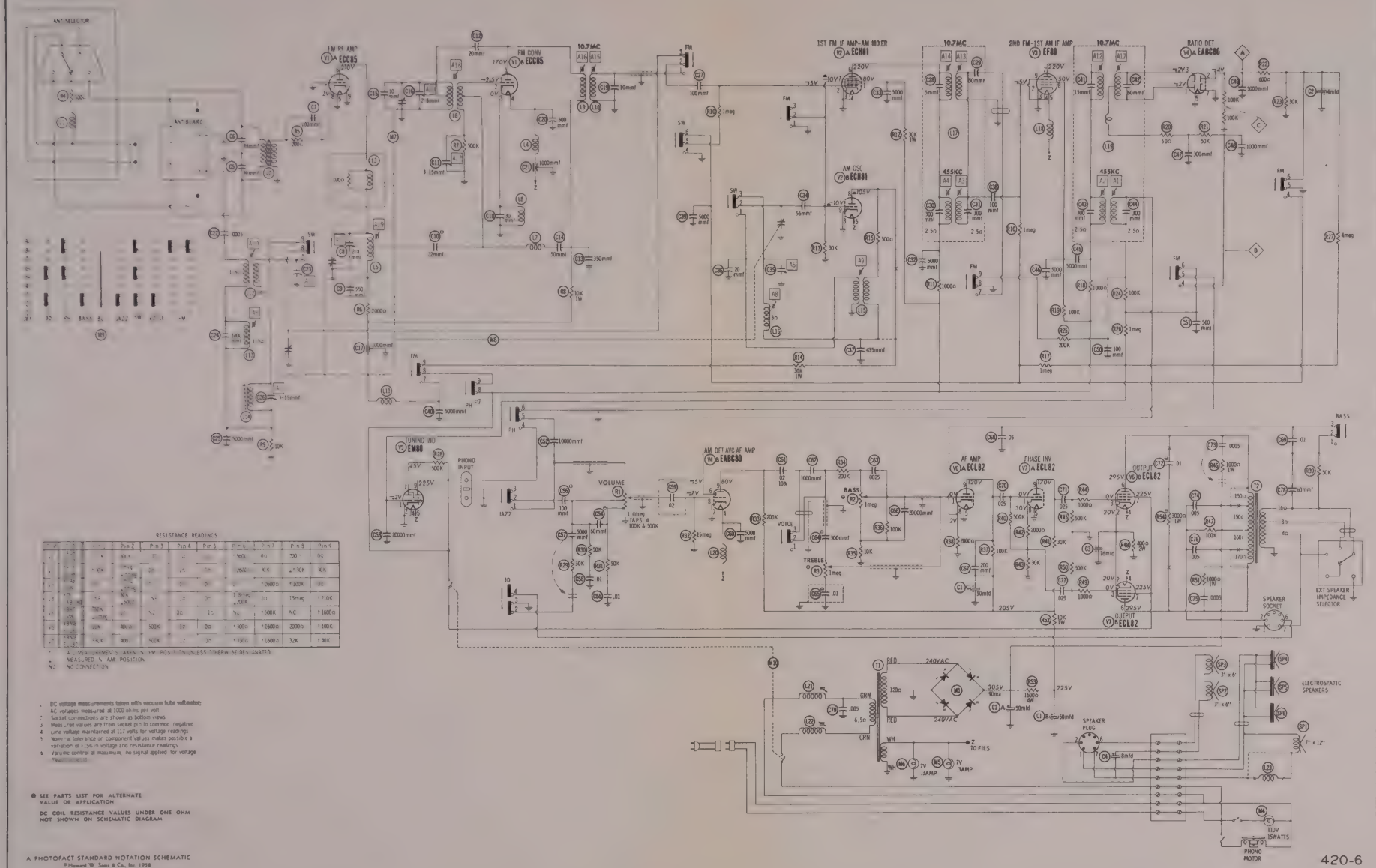


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

		Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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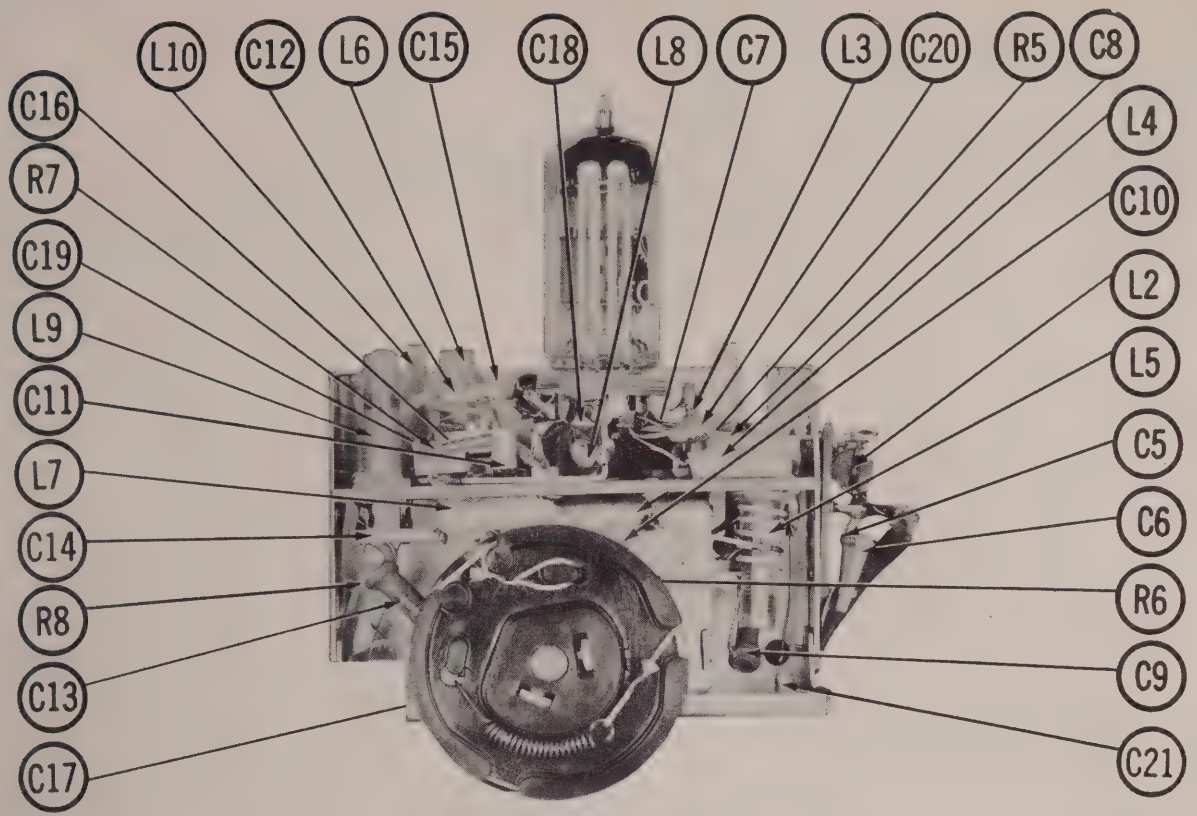
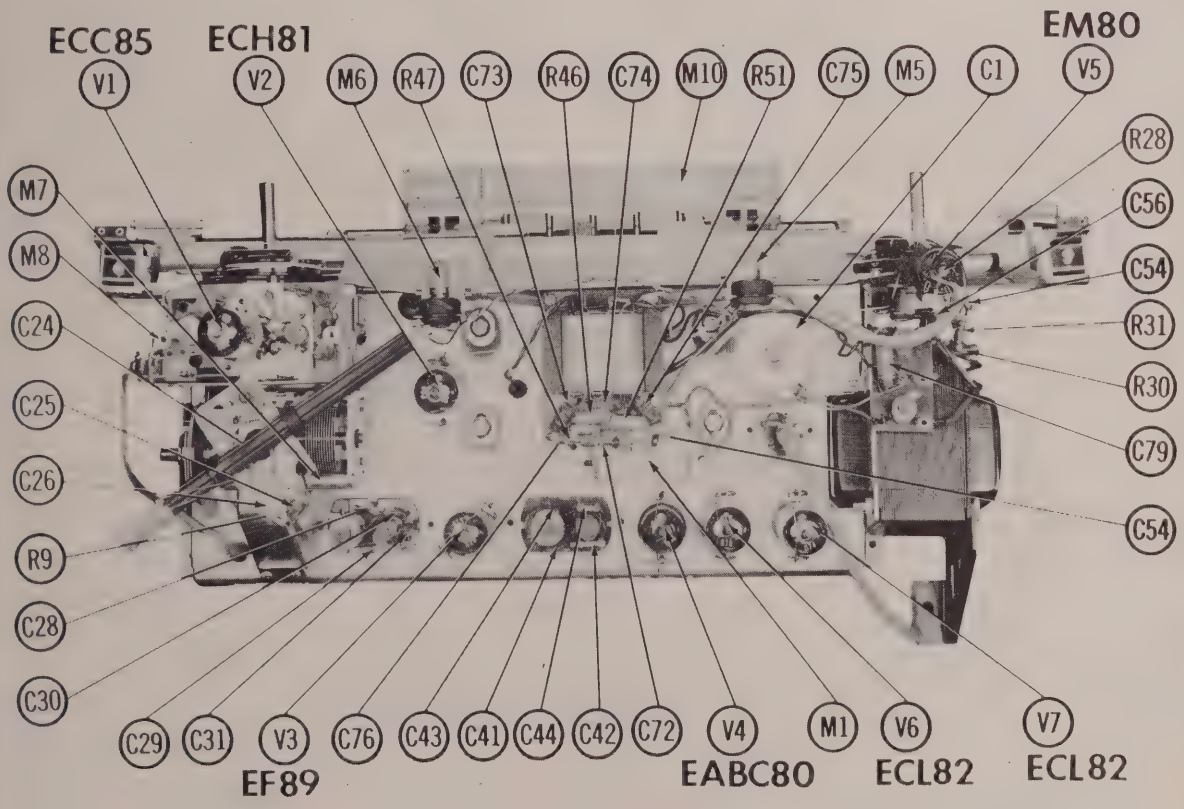
420-6



FM RF SUB-CHASSIS



CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to Pin 2 (grid) of ECH81 (V2). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM output.
3.	"	"	1600KC	"	1600KC	"	A6, A7	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A8	" Repeat Steps 3 and 4.
5.	"	"	6MC	SW	6MC	"	A9, A10	"
6.	"	"	15MC	"	15MC	"	A11	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	200mmf	High side to Pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A12, A13, A14, A15, A16	Adjust for maximum output
8.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct reading.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

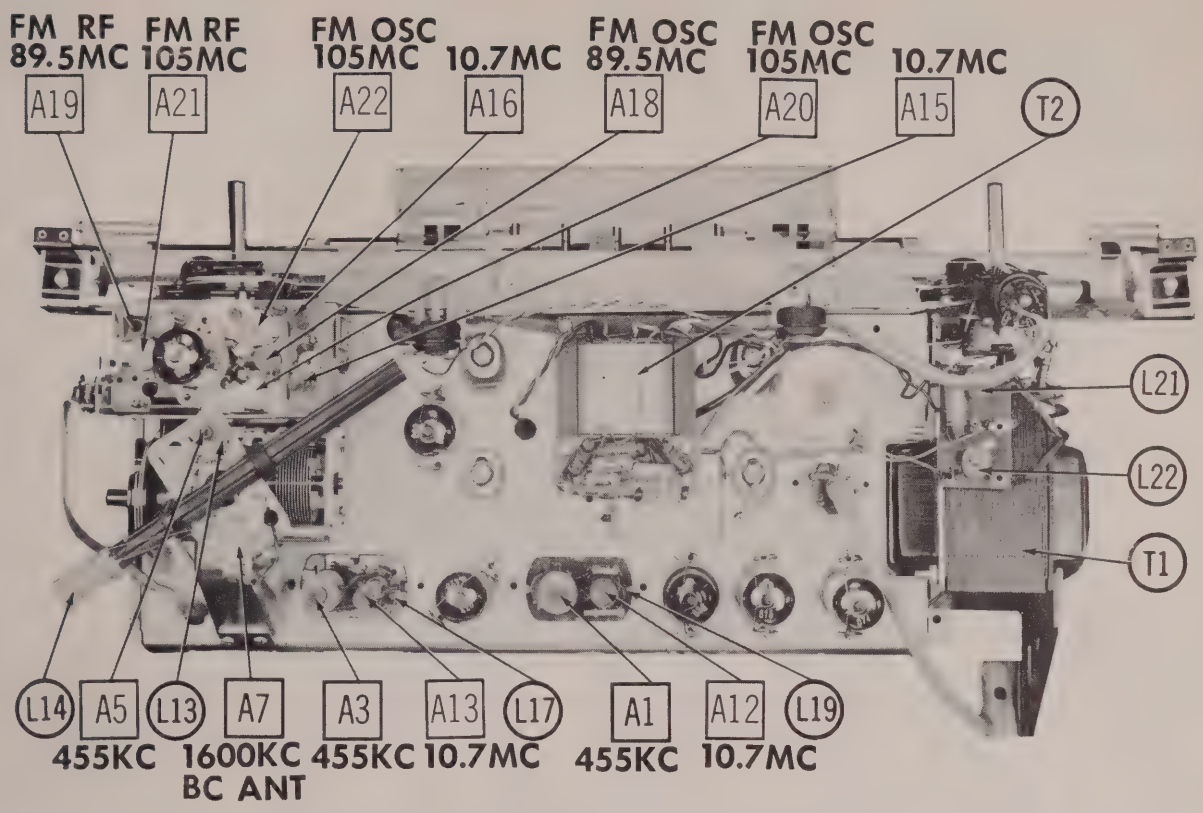
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	200mmf	High side to Pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (450KC Swp.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A12, A13, A14, A15, A16	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symetry similar to Fig. 1.
8.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A17	Reconnect syabilizing capacitor C2. Adjust so that 10.7MCoccurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines

FM RF ALIGNMENT

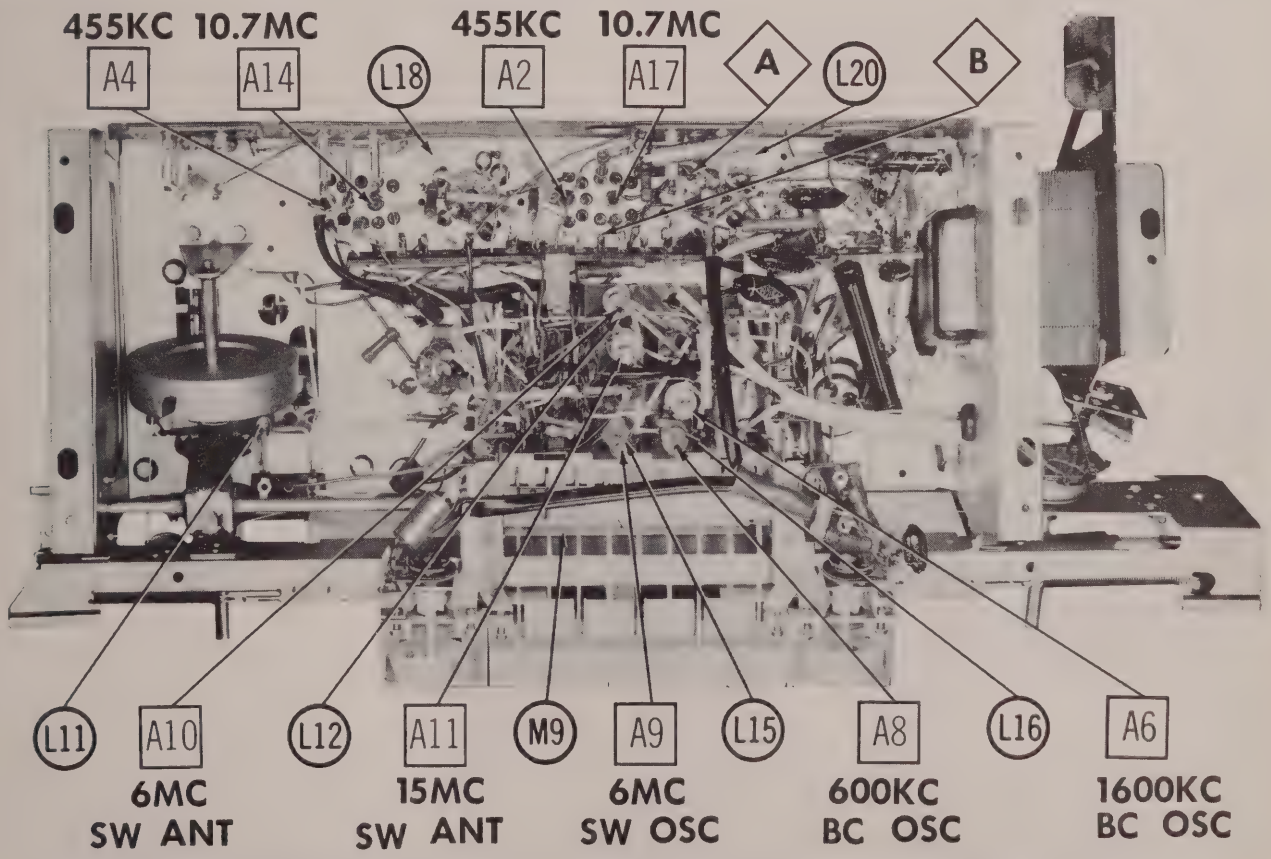
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω Carbon Resistor	Across FM antenna input receptacle with 270Ω in high side.	89.5MC (Unmod.)	FM	89.5MC	DC probe to point (A). Common to chassis.	A18 A19	Adjust for maximum deflection.
10.	"	"	105MC	"	105MC	"	A20 A21	"
11.	"	"	"	"	"	"	A22	Adjust for MINIMUM deflection.

FIG. 1

FIG. 2



CHASSIS-TOP VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW- INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85/6AQ8 ①
V2	1st FM IF Amp. -AM Mixer AM Oscillator	ECH81/6AJ8 ①
V3	2nd FM-1st AM IF Amp.	EF89/6DA6 ①
V4	Ratio Det. -AM Det. -AVC-AF Amplifier	EABC80/6T8 ①
V5	Tuning Indicator	EM80/6BR5 ①
V6	AF Amp. -Output	ECL82/6BM8 ①
V7	Phase Inv. -Output	ECL82/6BM8 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

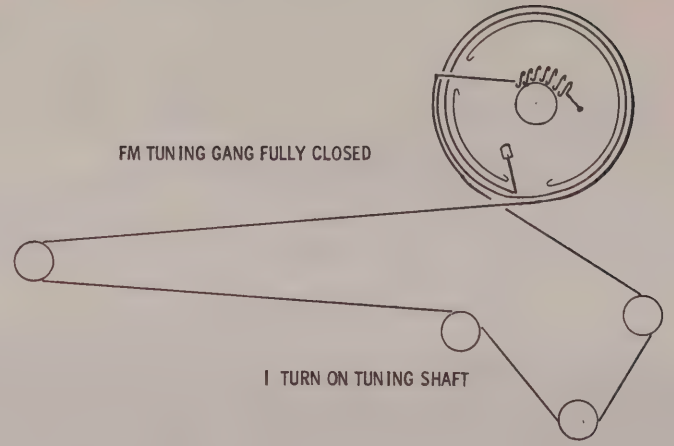
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Olympic-Opta PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385	COG25157						
B	50	385							
C	50	385							
C2	4	80		PRS150V4	BBR4-150	TC40	TD-4-150	MT-1504	TVA-1402
C3	16	35		PRS150V16	BBR16-90	TC44	TD-16-150	MT-1516	TVA-1409
C4	8	35		PRS150V8	BBR8-150	TC41	TD-8-150	MT-1508	TVA-1405

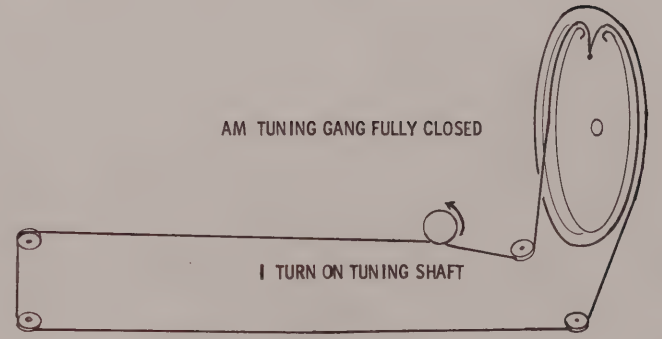
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	39			SI39	D6-390	LT6Q39	UC-5439	5GA-Q39	
C6	39			SI39	D6-390	LT6Q39	UC-5439	5GA-Q39	
C7	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C8	2-8								
C9	550			SI560	D6-561	LT6T56	UC-5356	5GA-T56	
C10	22			SI22	D6-220	LT6Q22	UC-5422	5GA-Q22	Note 1
C11	3-15								
C12	20			SI20	TCZ-20	CTA6Q2C	ZT-542	5GA-Q2	
C13	350							5GA-T35	
C14	50			SI50	D6-500	LT6Q5	UC-545	5GA-Q5	
C15	10			SI10	D6-100	LT6Q1	UC-541	5GA-Q1	
C16	2-8								
C17	1000			EF-001	MFT-1000			503C-D1	
C18	30			SI30	TCZ-30	CTA6Q3C		5GA-Q3	

DIAL CORD STRINGING





PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C19	10			SI10	D6-100	L10Q1	UC-541	5GA-Q1	
C20	500			SI500	D6-501	L10T5	UC-535	5GA-T5	
C21	1000			EF-001	MFT-1000			503C-D1	
C22	.0005	500		P688N-.0005	D6-501	CUB6T5	GEM-3035	6TM-T5	
C23									
C24	1000			1468-001	DD-102	1W5D1	MC255	1FM-21	
C25	5000			1467-005	DD-502	1W5D5	MC465	1FM-25	
C26	3-15								
C27	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C28	5			DI5	D6-050	CTA6V47C	ZT-555	5TCCB-V47	
C29	50			SI50	D6-500	LT6Q5	UC-545	5GA-Q5	
C30	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	
C31	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	
C32	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C33	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C34	56			SI56	D6-560	LT6Q56	UC5456	5GA-Q56	
C35									
C36	20			SI20	D6-200	CTA6Q2C		5GA-Q2	
C37	435								
C38	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C39	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C40	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C41	15			DI15	DD-150	LT6Q15	UC-5415	5GA-Q15	
C42	60								
C43	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	
C44	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	
C45	5000			SI5000	D6-502	LT6D5	UC-525	6HK-D5	
C46	5000			SI5000	D6-502	LT6D5	UC-525	6HK-D5	
C47	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	
C48	1000			1468-001	DD-102	1W5D1	MC255	1FM-21	
C49	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C50	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C51	560			SI560	D6-561	LT6T56	UC-5356	5GA-T56	
C52	10000			1467-01	DD-103	1D3S1	MC475	1FM-11	
C53	20000				DD-203				
C54	60								Note 2
C55	.01	125		P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	Note 3
C56	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C57	5000			1468-005	DD-502	1W5D5	MC465	1FM-25	
C58	.01	125		P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C59	.02	250							
C60	5000			SI5000	D6-502	LT6D5	UC-525	5HK-D5	
C61	.02	500					GEM-1612		10%
C62	1000			1468-001	DD-102	1W5D1	MC255	1FM-21	
C63	.0025	125			D6-252		GEM-6225	6TM-D25	
C64	300			1468-0003	DD-301	5W5T3	MC241	1FM-33	Note 4
C65	.01	500							Note 5

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Olympic-Opta PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke		19-1003	BC-564	4608		3.9 Microhenries
L2	FM Ant. Trans.						
L3	RF Choke						Wound on 100Ω resistor
L4	Fil. Choke		19-1001	BC-562	4604		1.4 Microhenry
L5	FM RF Coil						
L6	FM Osc. Coil						
L7	RF Choke						
L8	Cathode Choke						
L9	1st FM IF Pri.						
L10	1st FM IF Sec.						
L11	RF Choke		19-1000	BC-561	4602		1 Microhenry
L12	SW Ant. Trans.						
L13	IF Trap						
L14	Loop Stick	LPG25049					
L15	SW Osc. Coil						
L16	BC Osc. Coil						
L17A	2nd FM IF	TRG25159					
B	1st AM IF						
L18	Fil. Choke		19-1001	BC-562	4604		1.4 Microhenry
L19A	Ratio Det.	TRG25160					
B	2nd AM IF						
L20	Fil. Choke		19-1001	BC-562	4604		1.4 Microhenry
L21	Line Choke						
L22	Line Choke						
L23	Crossover Choke						

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Olympic-Opta PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .53A	240V@ .090A	6.3V@ 3.2A	TRG25155						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Olympic-Opta PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7000Ω CT Taps @ 1000Ω from CT	16Ω Taps @ 8Ω, 4Ω	TRG25201							

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C66	20000	125			DD-203				
C67	200			SI200	D6-201	LT6T2	UC-532	5GA-T2	
C68	.05	125		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C69	.01	125		P288N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C70	.025	500		P688N-025		CUB6S22	GEM-6125	6TM-S22	
C71	.025	500		P688N-025		CUB6S22	GEM-6125	6TM-S22	
C72	.01	500		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	Note 6
C73	.0005	500		P688N-0005	D6-501	CUB6T5	GEM-3035	6TM-T5	
C74	.005	500		P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C75	.0005	500		P688N-0005	D6-501	CUB6T5	GEM-3035	6TM-T5	
C76	.005	500		P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C77	.025	500		P688N-025		CUB6S22	GEM6125	6TM-S22	
C78	60								
C79	.005	500		P688N-005	D6-502	CUB6D5	GEM625	6TM-T5	

Note 1. Some versions may use 20mmf in this application.
Note 2. Some versions may use 100mmf in this application.
Note 3. Some versions may use 60mmf in this application.
Note 4. Some versions may use 250mmf in this application.
Note 5. Some versions may use .005mf 500V in this application.
Note 6. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Olympic-Opta PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1.4meg	1/2	PTG25056				UDT-291	Volume, Tap ⓐ 100K and 500K
R2	1meg	1/4	PTG25115					Bass Note 1
R3	1meg	1/4	PTG25114					Treble Note 2

Note 1. Part of Bass control assembly Part #SAG25192.
Note 2. Part of Treble control assembly Part #SAG25193.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Olympic-Opta PART No.	NOTES
R4	100Ω			
R5	200Ω			
R6	2000Ω			
R7	500K			
R8	10K	1		
R9	10K			
R10	1meg			
R11	1000Ω			
R12	30K	1		
R13	30K			
R14	30K	1		
R15	300Ω			
R16	1meg			
R17	1meg			
R18	1000Ω			
R19	100K			
R20	50Ω			
R21	50K			
R22	600Ω			
R23	30K			
R24	100K			
R25	200K			
R26	1meg			
R27	4meg			
R28	500K			
R29	30K			

ITEM No.	RATING OHMS	RATING WATT	Olympic-Opta PART No.	NOTES
R30	50K			
R31	50K			
R32	15meg			
R33	200K			
R34	200K			
R35	10K			
R36	100K			
R37	100K			
R38	2000Ω			
R39	50K			
R40	500K			
R41	30K			
R42	2000Ω			
R43	30K			
R44	1000Ω			
R45	500K			
R46	1000Ω	1		
R47	100K			
R48	400Ω	2(WW)		
R49	1000Ω			
R50	500K			
R51	1000Ω	1		
R52	10K	1		
R53	1600Ω	4(WW)		
R54	3000Ω	1(WW)		Not used in some versions.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Olympic-Opta PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	7" x12"	PM	3-4Ω	SKG25031		
SP2	3" x6"	PM	5-6Ω	SKG25071		
SP3	3" x6"	PM	5-6Ω	SKG25071		
SP4	4"	Electrostatic		SKG25033		
SP5	4"	Electrostatic		SKG25033		
SP6	4"	Electrostatic		SKG25033		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Olympic-Opta PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.085A	RFG25156 (B250C100)		60-9150 ①	D-64 ②	① 2 Used ② Silicon

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Olympic-Opta PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Olympic-Opta PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		† RX551 or †♦ RX551SD or ♦ RX551D	† W-93TPS or †♦ W-93DS or ♦ W-93TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Olympic-Opta PART No.	NOTES
M4	Dial Lamp		110V, 15 Watts
M5	Dial Lamp		7V ⓐ .3A
M6	Dial Lamp		7V ⓐ .3A
M7	Tuner Unit	CVG25191	AM (Tuning Gang: Ant. 15-540mmf, Osc. 15-540mmf)
M8	Tuner Unit	CVG25189	FM
M9	Switch	PBG25158	Piano Keyboard Assembly
M10	Switch	SWG25187	Power On-Off, Rotary, Push Button Operated

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Knob	KNG25066-1	Volume and Tuning, Small
Knob	KNG25067-1	Volume and Tuning, Large
Knob	KNG25053	Bass and Treble
Cabinet	CAG25152	
Dial Glass	DLG25188	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 8039, 8041, 8050, A (Ch. 528.53060, 080, 120)

SILVERTONE MODELS 8039, 8041, 8050, A (Ch. 528.53060, 080, 120)

MODEL 8041

TRADE NAME	Silvertone Models 8039 (Ch. 528.53060), 8041 (Ch. 528.53120), 8050, 8050A(Ch. 528.53080)
MANUFACTURER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver with 4 Speed Automatic Record Changer (Model 8039 is a manual player)
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.26 Amp. @117 Volts AC (25 Watts Less Motor)
TUNING RANGE—BROADCAST	535-1630KC

FOR SERVICE INFORMATION ON 528.56100 SERIES RECORD CHANGERS REFER TO 567.40000 SERIES—PHOTOFACT SET 365 FOLDER 13 OR RECORD CHANGER MANUAL RC-10

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B—Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12BE6 (V1) Low side to B—	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1630KC	"	"	A5	"
3.	"	"	600KC	600KC	"	A6	Adjust for maximum output while rocking gang. Repeat Steps 2 & 3.
4.		Loop	1400KC	Tune to 1400KC signal.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat Steps

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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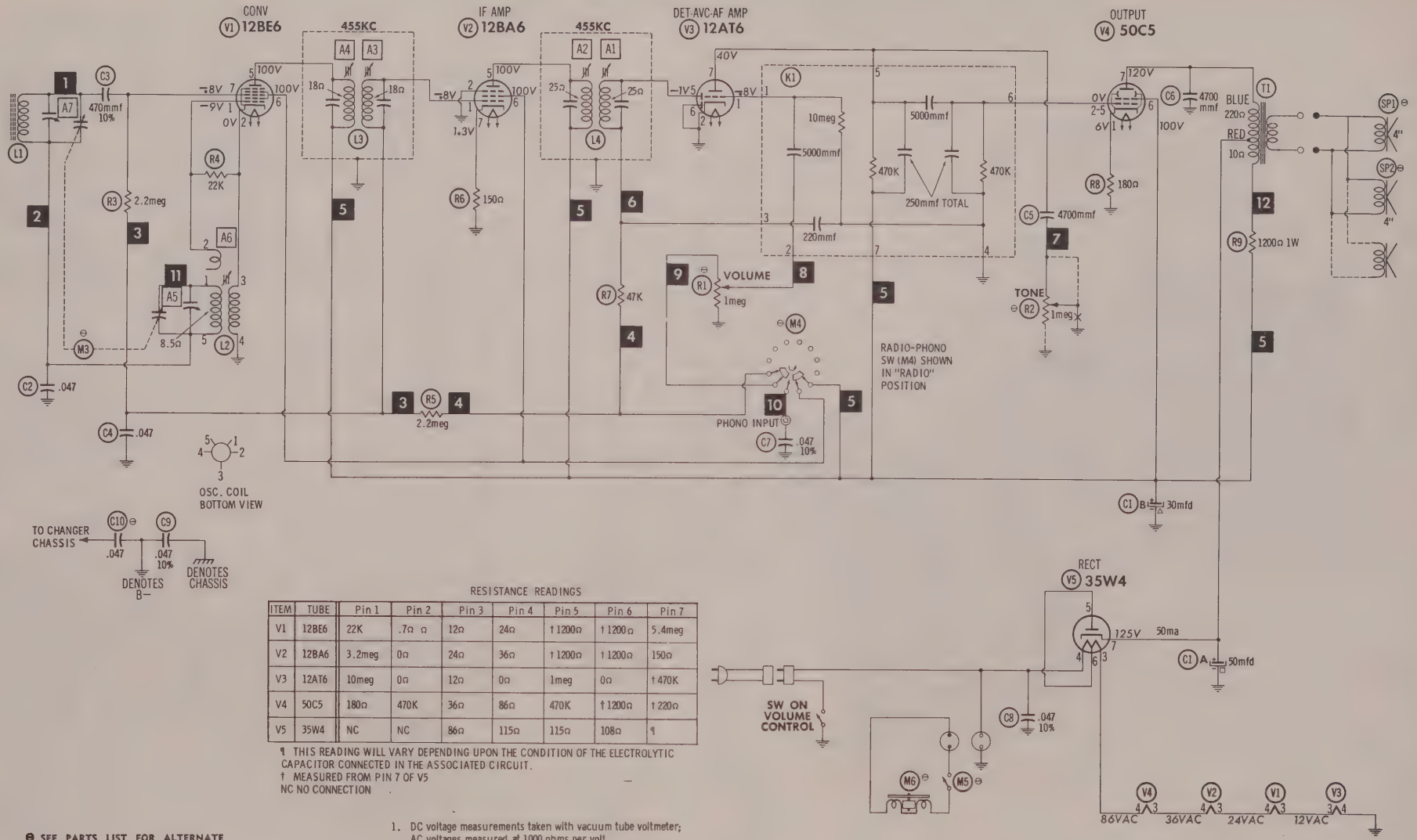
H660

SET 420 FOLDER 7



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω Ω	12Ω	24Ω	†1200Ω	†1200Ω	5.4meg
V2	12BA6	3.2meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	150Ω
V3	12AT6	10meg	0Ω	12Ω	0Ω	1meg	0Ω	†470K
V4	50C5	180Ω	470K	36Ω	86Ω	470K	†1200Ω	†220Ω
V5	35W4	NC	NC	86Ω	115Ω	115Ω	108Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	

ITEM No.	USE	TYPE	NOTES
V3	Det. -AVC-AF Amp.	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Silvertone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 50	150	18-49-5	AFH2-15-05	BBRD5315	PFP213.1	TDLD-8	FMD-301	R2230 *
B	▲ 30	150							

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	20-52-1	P488N-047	DF-503	BC-6S47J	ACE6147	4SE-S47	
C3	470		15-47116		MD-470				10%
C4	.047	200	20-47-1	P288N-047	DF-503	BC-2S47J	ACE6147	2SE-S47	
C5	4700		15-47216	BPD-0047	DD-472	BYA10D47M	UC-5247	5HK-D47	
C6	4700		15-47216	BPD-0047	DD-472	BYA10D47M	UC-5247	5HK-D47	
C7	.047	400	20-52-1						10%
C8	.047	400	20-52-1						10%
C9	.047	400	20-52-1						10%
C10	.047	200	20-47-1	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	Note 1.

Note 1. Not used in Model 8039

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Silvertone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	1/2	24-275-0 ①					Volume & Switch
R2	1meg	1/2	24-147-2 ②					Tone

① Part #24-273-0 used in Model 8039
② Part #24-163-2 is used in Model 8039

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	NOTES
R3	2.2meg		60-22501	
R4	22K		60-22301	
R5	2.2meg		60-22501	
R6	150Ω		60-15101	

ITEM No.	RATING OHMS	RATING WATT	Silvertone PART No.	NOTES
R7	47K		60-47301	
R8	180Ω		60-18101	
R9	1200Ω	1	60-12211	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Silvertone PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Stick	82-122-0					
L2	Osc. Coil	10-34-4					
L3	Input IF	10-81-2	16-6780	BC-356	13-PC9	RF-4	
L4	Output IF	10-71-2	16-6780	BC-357	13-PC10	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Silvertone PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω Tap ⓐ 6%	1-2Ω	80-9-1							

PRINTED BOARD

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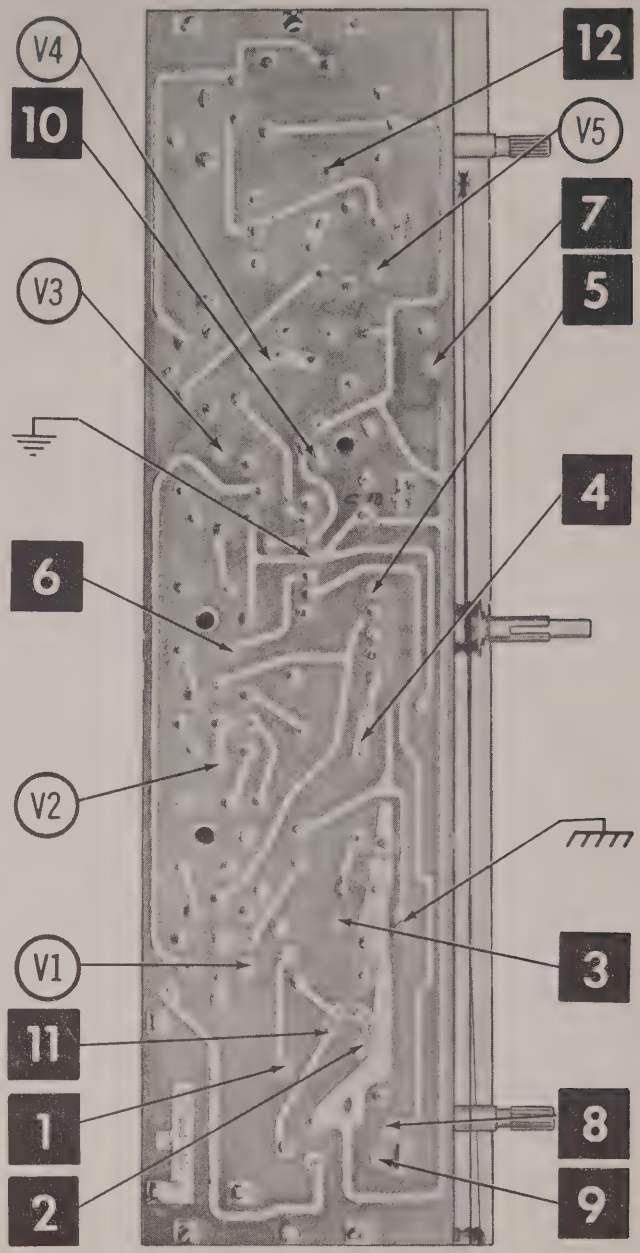
*TRADE MARK

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	33-298-4 ①	4A07	① Used in Model 8041 only.
SP2	4"	PM	3-4Ω	33-298-4 ①	4A07	② Used in Model 8039 only
	4"			33-299-4 ②		③ Used in Models 8050 and 8050A only.
	4"			33-299-4 ②		
	4"			33-348-4 ③		
	4"			33-348-4 ③		
	8"			33-360-4 ③		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Silvertone PART No.	REPLACEMENT DATA
K1	Audio Couplate	220mmf, 5000mmf, 5000mmf, 250mmf, 470K, 470K, 10meg	13-14-3	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Silvertone PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	33-235-0	53-T	GD-J			Models 8039, 8041
	33-286-0	53-T	GD-J			Models 8050, 8050A

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Silvertone PART No.	JENSEN PART No.	WALCO PART No.	
M2	83-1172	† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	Model 8039, 8041
	83-1178	† S-61 or †♦ S-61SD or ♦ S-61D	† W-77TPS or †♦ W-77DS or ♦ W-77TPD	Models 8050, 8050A

* Metal † Jewel ♦ Diamond

MISCELLANEOUS

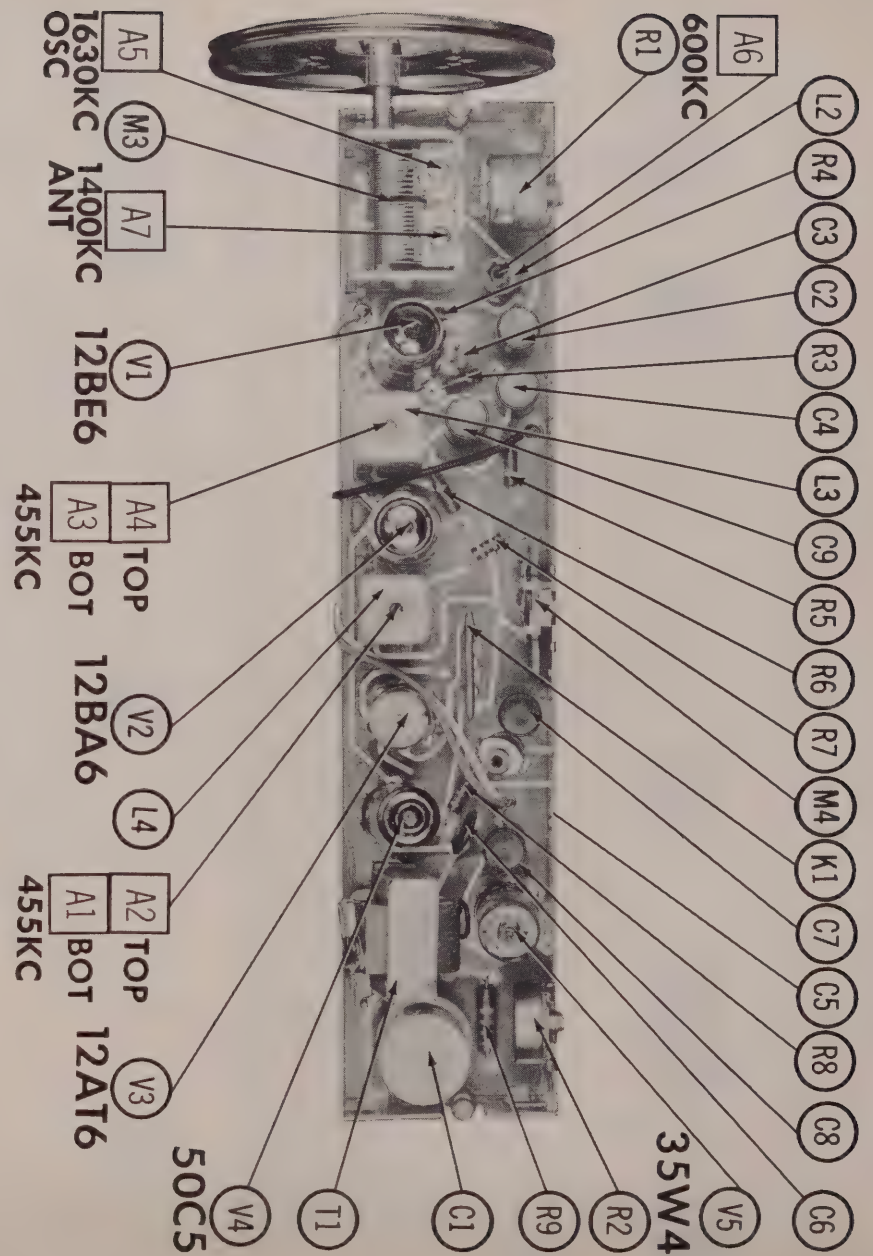
ITEM No.	PART NAME	Silvertone PART No.	NOTES
M3	Tuning Cap.	19-60-2	2 gang, Models 8041, 8050, 8050A
	Tuning Cap.	19-58-2	2 gang, Model 8039
M4	Switch	69-244-0	Radio-Phono (DPDT Rotary Wafer) Models 8041, 8050, 8050A
	Switch	69-243-0	Model 8039
M5	Switch	84-4160	Phono Motor, Models 8041, 8050, 8050A

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



PHOTOFACT* Folder

EIA

SILVERTONE MODEL 9076
(Ch. 528.58070, 528.59130, 131, 190, 191)

SILVERTONE MODEL 9076
(Ch. 528.58070, 528.59130, 131, 190, 191)

SILVERTONE MODEL 9076
(Ch. 528.58070, 528.59130, 131, 190, 191)

GENERAL INFORMATION

Silvertone Model 9076 tape recorders record and play back two tracks of material on standard-width recording tape, thus doubling record and playback time with no loss of frequency response or quality. Recordings can be made from a radio, television, or phonograph, in addition to those made directly from a microphone.

This recorder will play back stereo tape, but cannot record it.

The Model 9076 has two speeds for dual-track recording, 3 3/4 and 7 1/2 ips. Recording time for both tracks is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1,200 ft.)	2 hours	1 hour

Connect this recorder to an outlet supplying 110-120 volts, 60 cycles AC only.

SUPPLIED BY:

SEARS, ROEBUCK AND COMPANY
925 SOUTH HOMAN AVENUE
CHICAGO 7, ILLINOIS

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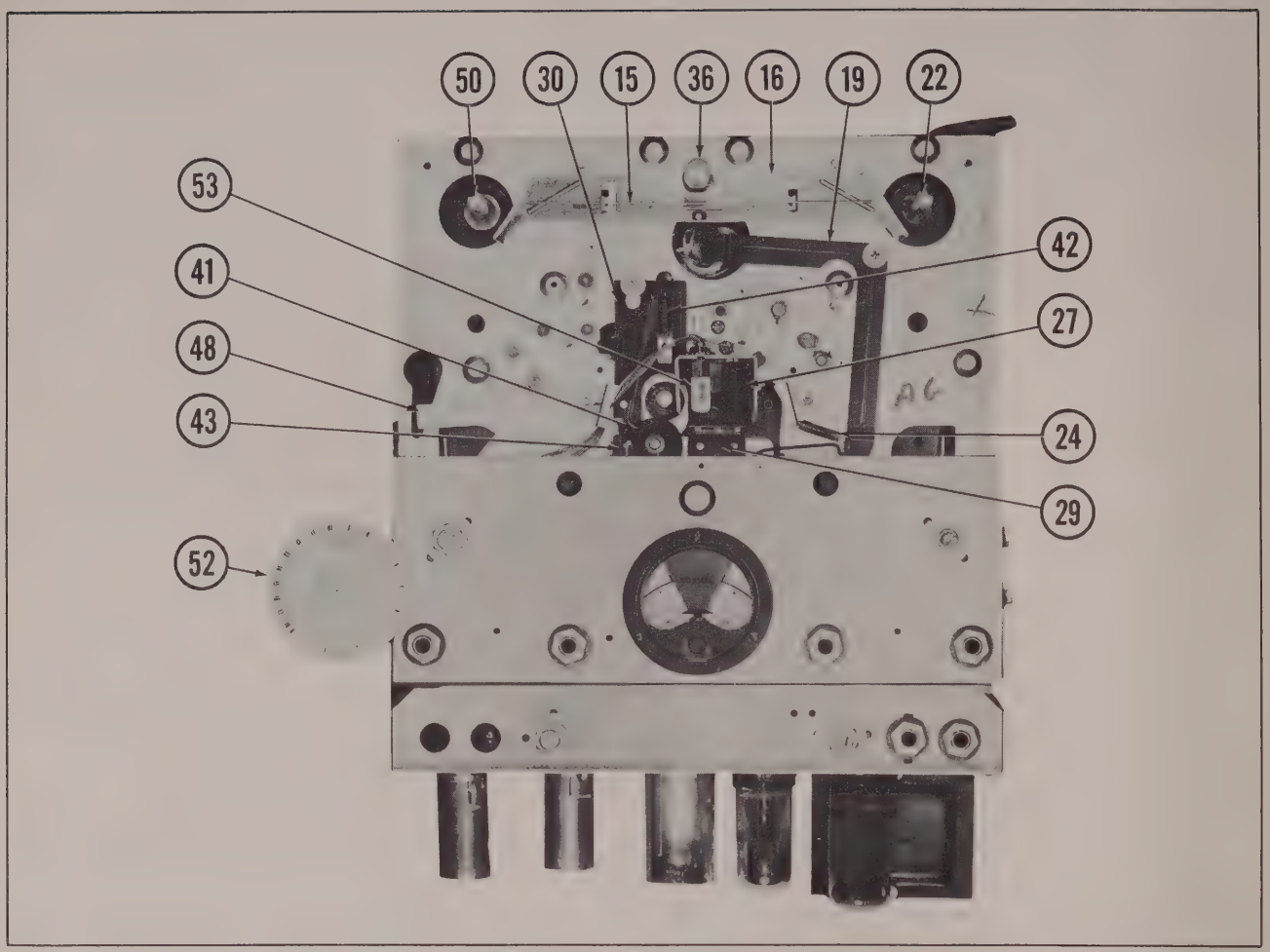


FIG. 1 TOP VIEW OF MECHANISM WITH COVER REMOVED

RECORDER PREPARATION

1. Open cover on recorder and remove power cord and microphone from storage space at rear of unit.
2. Remove cover by unlocking hinges. Place unit so that controls are accessible and at a convenient height.
3. Plug power cord into a 110-120 volt, 60-cycle AC outlet.
4. Recorder is now ready for use. Before operating, the operator should familiarize himself with the operating controls.

FUNCTION OF CONTROLS

On-Off-Volume

Left-hand knob on recorder panel operates as a master switch for amplifiers and tape motor, as well as controlling playback and record volume. Rotating this knob clockwise from extreme left position turns on amplifier. Turning knob further to right increases volume; turning knob to left decreases volume.

Tape Drive

Knob to right of Volume control operates tape drive mechanism for playback and record.

This knob has two positions--Idle and Playback-Record. At Idle, the recorder will not play back or record. In Playback-Record position, this knob switches the tape drive into position for playback or record.

Record-Edit

Small metal knob directly behind the recording level meter controls the amplifier circuits for record or playback. This knob is used with the Tape Drive control. With Record-Edit knob in up (normal) position, amplifier circuit is set for playback. When Tape Drive control is turned to right, tape will begin moving through tape slot, and any sound previously recorded on tape will be reproduced.

Depressing Record-Edit control switches the amplifier to Record. When this control is held down, it will lock in down position as the Tape Drive knob is turned to right. Tape will now move through tape slot, and machine will record.

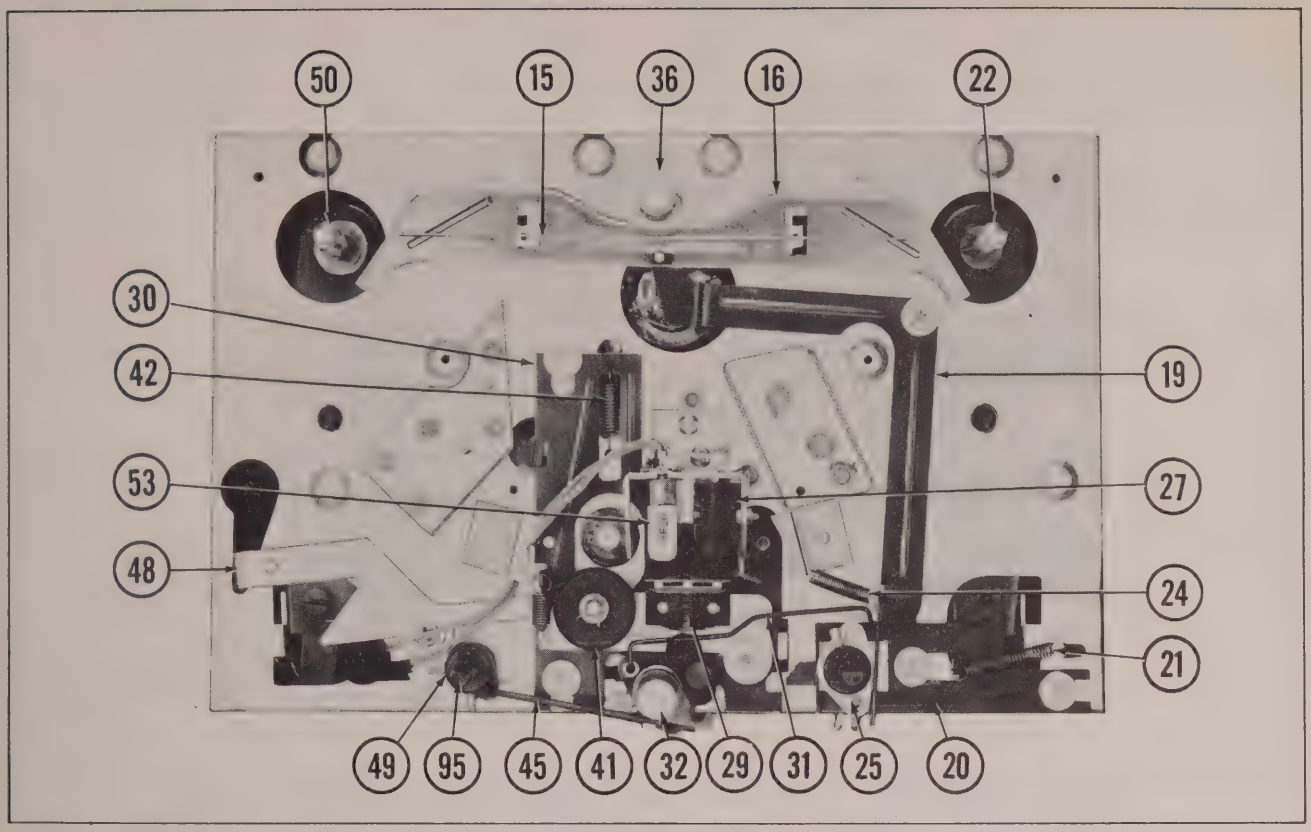


FIG. 2 TOP VIEW OF MECHANISM WITH COVER AND AMPLIFIER REMOVED

Fast Forward-Rewind

Knob to right of Record-Edit knob controls high-speed forward and rewind mechanism. With Tape Drive knob in Idle, moving Forward-Rewind knob to right (clockwise) winds tape onto Take-up reel. Moving knob to left (counterclockwise) rewinds tape onto Feed reel.

Tone-Monitor Control and Motor Switch

Knob on right side of control panel operates the motor when amplifier switch is on and acts as a monitor control, in addition to regulating tone during playback.

With motor on, further rotation of knob varies tone from bass to treble.

When this control is in extreme left position, motor is off even with amplifier turned on. Thus, proper volume level can be obtained during recording without running tape through machine. Tape mechanism may be engaged and Volume control set while tape is not moving.

When set is in Record position, tone knob controls monitor circuit. For proper monitor volume level, tone control should be set as far counterclockwise as possible without turning off motor and then rotated slowly clockwise until a suitable volume level for monitor circuit is obtained.

Speed Control

Speeds are changed by placing Speed button in Up or Down position, Up for 3 3/4 ips, and Down for 7 1/2 ips.

Auxiliary Amplifier Off-On-Volume Control

This control turns auxiliary amplifier on and off, as well as controlling volume on auxiliary amplifier for stereo playback. Rotating knob to right (clockwise) turns on amplifier, and further rotation increases volume.

NOTE: This control will not operate unless main amplifier On-Off-Volume control is on.

Auxiliary Amplifier Tone Control

This control regulates tone during playback of stereo tape. Rotating the knob varies tone from bass to treble.

CLEANING

Record head (53) and erase head (27), capstan shaft (68), and pressure roller (41) may accumulate tape coating residue, worn off the tape as it passes these parts. This residue can cause distortion, weak output, and poor erasure. Clean head surfaces, capstan, and pressure roller with a soft cloth and alcohol.

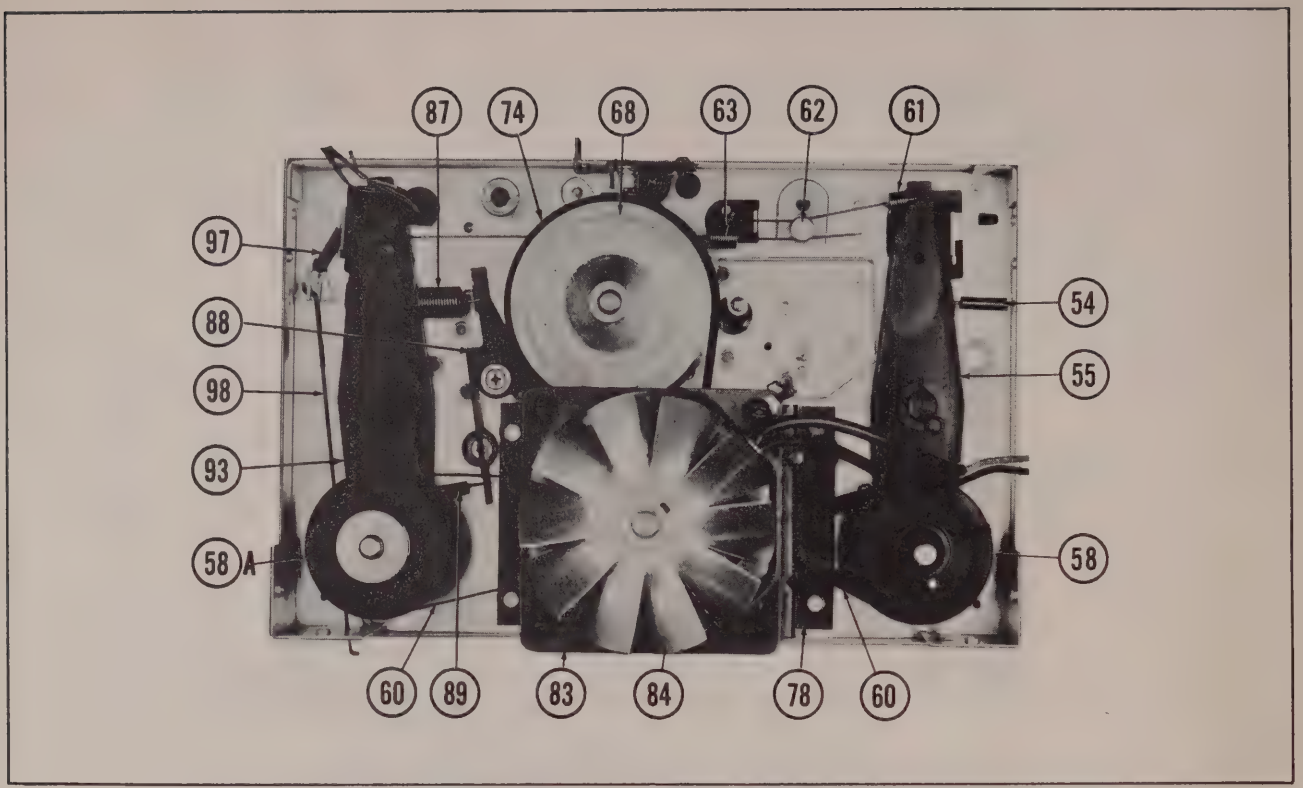


FIG. 3 BOTTOM VIEW OF MECHANISM WITH COVER AND AMPLIFIER REMOVED

OPERATING INSTRUCTIONS

Threading Tape

1. Place a reel of tape on right reel plate and an empty reel on left reel plate, making certain that reel slot engages pins on reel plates .

2. Unwind about 10" of tape from reel. Hold a section of tape taut with both hands and insert tape in tape slot, making certain that dull-coated side of tape faces rear of recorder .

3. Insert free end of tape into one of three radial slots in hub of empty reel. Turn reel several turns clockwise to secure tape to reel and to take up all slack between reels.

To Record from Microphone

1. Turn Off-On-Volume control clockwise and allow sufficient time for tubes to warm up.

2. Insert microphone plug into Mike jack.

3. Make sure Tone-Monitor and Motor switch is in off position. Depress Record-Edit knob, hold it down, and turn Tape Drive knob to right until both knobs lock in place .

4. Speak into microphone in a normal voice and turn Volume control to right until pointer on recording level meter fluctuates within Normal range only. If possible, make a preliminary recording to determine correct setting of Volume control for type of material being recorded. For ordinary voice recording , hold microphone about six to twelve inches from mouth.

5. Turn on Tone-Monitor and Motor switch . Adjust Tone-Monitor control to proper level . Adjust Speed control knob for desired speed .

NOTE: Correct recording volume is important. Too weak a signal, which does not cause the record level to fluctuate, results in weak playback and high background noise. Too strong a signal, causing level indicator to go above Normal range, results in distortion.

To Record from Radio-Phonograph or Television

Recordings may be made by one of three methods:

1. Place microphone six to twelve inches in front of speaker. Turn Volume control to a normal level. Turn Tone control to maximum treble. Set recording level and proceed with recording as described under "To Record from Microphone."

2. Use a speaker cable having a two-conductor phone plug on one end and two alligator clips on the other end. Connect alligator clips across voice-coil terminals of speaker and insert phone plug into Radio jack. Set Volume and Tone controls as described in Step 1 . Set recording level and proceed as described under "To Record from Microphone."

3. Use a shielded cable with a two-conductor phone plug on one end and connect other end across Volume control. Insert phone plug into Radio jack. Set recording level and proceed as described under "To Record from

Microphone." Volume and Tone controls have no effect on this setup and may be left in any position.

Dual-Track Recording

With this recorder, only one-half the tape width is recorded at a time, thereby resulting in two-track recording. This two-track operation is accomplished in the following manner:

1. After one track of tape has been recorded, turn Tape Drive control to Idle.
2. Remove reels; turn full reel over and place it on right reel plate and empty reel on left reel plate.
3. Properly thread tape as described under "Threading Tape" and proceed with recording.
4. After this second track has been recorded, first track is ready to be played without rewinding, by reversing reels as described in Step 2.

To Play a Recording

1. Thread tape as described under "Threading Tape."
2. Turn Tape Drive control clockwise without depressing Record-Edit button.
3. Adjust Volume and Tone controls for desired listening level.

To Use an External Speaker

1. A speaker larger than the one in the recorder may be used to improve the frequency response. Use speaker cable as outlined in the following step.
2. Connect cable to external speaker with alligator clips. Plug cable into external speaker jack and play recorder through external speaker.

CAUTION: Do not connect plug into output jack unless external speaker is attached to plug, as output tube, transformer, and Tone control may be damaged.

3. For stereo operation, wire an additional matched speaker as described in Step 2. Plug cable into external speaker jack on auxiliary amplifier.

To Edit and Splice Tape

NOTE: Since one track cannot be edited and spliced without affecting the other track, recordings to be edited should be limited to one track only.

1. Tape may be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements may be inserted between selections. Unused sections of tape can be spliced for re-use.
2. For best results, cut tape at a slight diagonal, join ends with splicing tape on glossy side, and trim off any excess width.

Erasing Recorded Material

In the Record position, any recording is automatically erased before a new one is put on. To erase a recording without putting a new one on tape, follow normal recording procedure, but leave Volume control at its extreme counterclockwise position.

To Use as a Public Address System

1. Insert microphone plug into Radio jack.
2. Leave Tape Drive control on Idle.
3. Speak into microphone and adjust Volume and Tone controls for desired level.
4. Do not place microphone too close to speaker, as feedback howl will result.

Stereo Tape Playback

1. Thread tape as described under "Threading Tape."
2. Turn main amplifier Off-On-Volume, Tone-Motor Off-On, and Auxiliary amplifier to On position.
3. Adjust Speed control.
4. Plug external speaker into Auxiliary Amplifier jack.
5. Turn Tape Drive knob to right, but do not depress Record-Edit button.
6. Adjust Volume and Tone controls on main auxiliary amplifiers to desired levels.

LUBRICATION

Lubricants applied during manufacture should be sufficient for a long period of time. Approximately once a year, or if parts are replaced, lubricate as follows:

With No. 20 Motor Oil:

1. Take-up reel arm (93) bushing.
2. Supply reel arm (55) bushing.
3. Spindles (22) and (50) bearings.
4. Flywheel (68) bearings.

With Staput No. 312 Grease or Lubriplate:

1. Pressure plate (30) at slide button and guide on right side.
2. On stud of cam (35) and bushing assembly.

CAUTION: Do not oil motor bearings unless absolutely necessary, as excess oil will be thrown off, causing slippage of pulley and rollers. Always use as little oil as possible. If oil should get on pulleys and rollers, wipe off with alcohol. Do not use carbon tetrachloride.

DISASSEMBLY

To Remove Unit from Cabinet

1. Remove control knobs.
2. Remove reel plate pans.
3. Remove five wood and two metal screws from front top cover.
4. Remove four hex nuts and washers from controls.
5. Remove front top cover.
6. Remove four metal screws from rear top cover.
7. Remove rear top cover.
8. Remove baffle, spacers, and insulating washers on amplifiers.
9. Remove four screws from bottom of cabinet .
10. Slide unit back toward rear of cabinet and disconnect speakers.
11. Lift unit from cabinet.

To Remove Auxiliary Amplifier

1. Remove four metal and two wood screws from mounting rails.
2. Remove wood block.
3. Remove tape counter drive belt.
4. Remove four screws (two on each side) at top of auxiliary amplifier.
5. Remove Record-Playback plug from socket and remove auxiliary amplifier.
6. Remove four snaps on bottom shield and remove shield.

To Remove Main Amplifier

1. Remove Auxiliary Amplifier as outlined above.
2. Remove four metal screws (two on each side) and remove tape counter.
3. Remove four snaps on bottom shield and remove shield.
4. Remove screws at top of amplifier securing it to tape transport.
5. Remove Record-Playback head plug and motor plug from their sockets.
6. Remove amplifier from tape transport.
7. To reassemble, reverse the foregoing procedure.

ADJUSTMENTS

Spindle End Play

Spindles (22) and (50) should have between 1/ 32" to 1/ 16" up and down movement. Loosen set screw (59) in feed pulley (58) and move pulley up or down until correct amount of end play is obtained.

Take-up and Feed Reel Drag

When Tape Drive control is in Idle, reels should stop immediately to prevent tape from looping. Also, reels should stop without looping tape when control is released in Fast Forward or Rewind. This is governed by the stop arm on baseplate (point "B" on Exploded View) against which feed reel arm (55) and take-up arm (93) rest when tape is not moving. Stop arms should be bent to force feed reel arm (55) and take-up arm (93) over far enough to take up enough belt tension so that spindles start to revolve without reels being in place. When making this adjustment, Tape Drive control should be in Idle. With reels in place, spindles should not revolve. If either spindle does revolve, force stop arm (point "B" on Exploded View) over until the spindle stops.

Play-Record Head

Record head (53) must be aligned perfectly with tape. If it is not, low output, loss of high frequencies, or track overlap may result. When aligning record head (53), observe the following:

1. To adjust for output and frequency response, a tape on which a 3,000-cycle note has been recorded by a unit known to be in good operating condition is required.
2. Connect an output meter across speaker voice coil of unit being adjusted.
3. While playing back the 3,000-cycle note tape, move head back and forth on mounting until maximum amplitude on output meter is achieved.
4. Make certain that record head (53) height is correct. When maximum gain is achieved, head height should be correct.
5. If a 3,000-cycle note cannot be made, use a recording with a high note content and make necessary adjustments.

Erase Head

Erase head (27) has been prealigned at the factory. To replace erase head (27), record head (53) must be removed. After erase head (27) has been installed, record head (53) must be realigned (see "Play-Record Head").

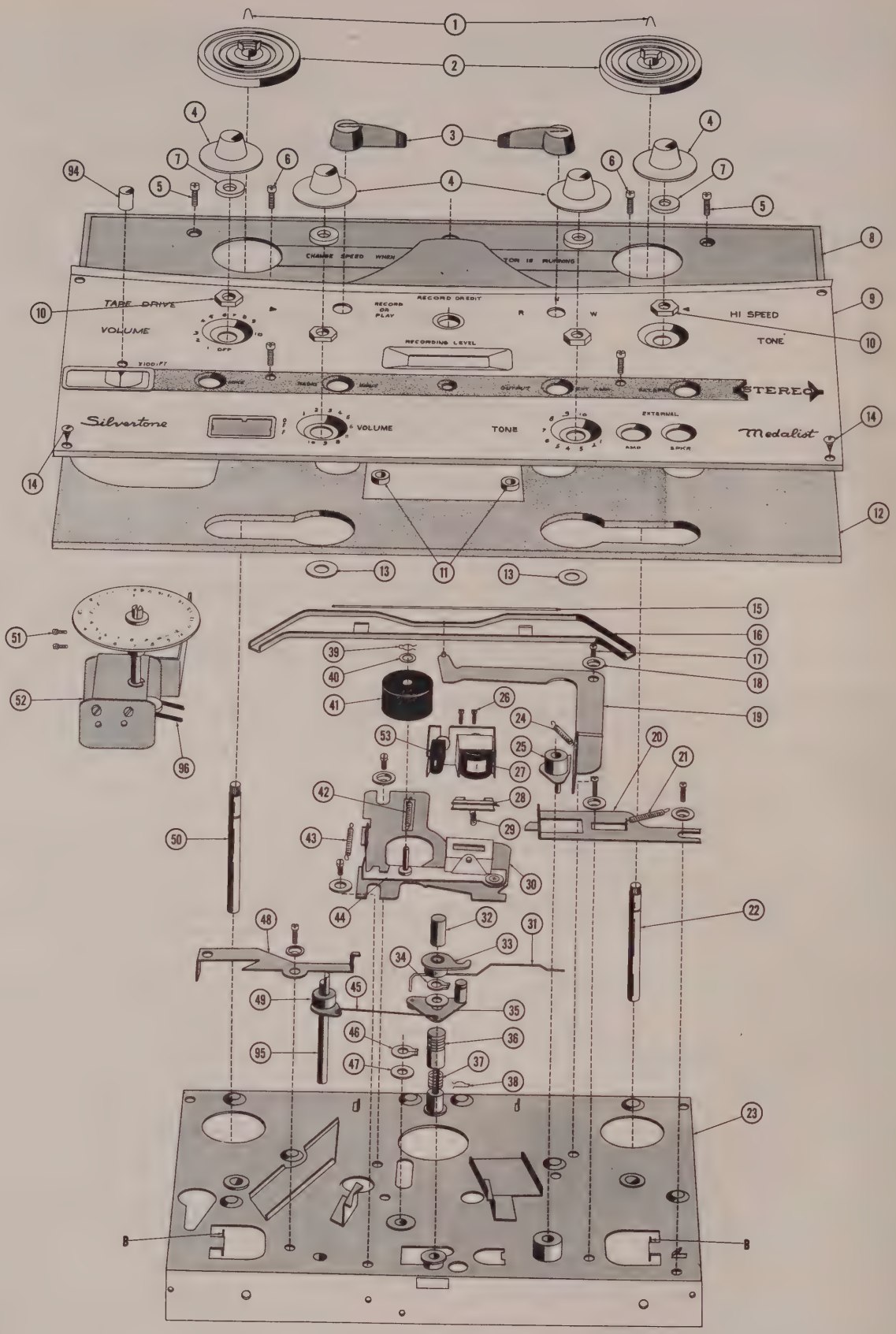
AMPLIFIER ADJUSTMENT

Whenever circuit components are replaced or repaired in amplifier, the following adjustments should be made. These adjustments must be made with set turned on and in Record position, but with no signal input.

1. Adjust oscillator coil (L2) for 52.5-kc reading on frequency meter.
2. With unit turned off, adjust slotted head screw, under Recording Level Meter, to point where needle on meter rests directly over black dot on left side of meter. Turn unit on, set volume at mimimum and in Record position. Remove screw to right of external amplifier jack and insert a thin screwdriver and adjust (R3) so needle rests directly over black dot.
3. To adjust 52.5-kc trap (L1), volume must be set at maximum. Adjust trap (L1) for mimimum 52.5-kc reading at external amplifier jack.
4. With volume and treble set at maximum, set hum adjust (R4) for mimimum reading across load at external speaker jack.

TROUBLE CHART

Symptom	Cause	Remedy
Does not properly take up tape.	1. Spindle (50) binding.	1. Lubricate.
	2. Take-up drive belt (60) slipping.	2. Clean motor pulley and take-up pulley (58A).
	3. Take-up drive belt (60) broken.	3. Remove motor bracket (78) and replace take-up drive belt (60).
	4. Set screw (59) loose in take-up pulley (58A).	4. Tighten set screw (59), leaving 1/32" to 1/16" end play in spindle.
	5. Take-up pulley (58A) broken.	5. Replace take-up pulley (58A).
Fast Forward does not function properly.	1. See previous cause, except Step 2.	1. See previous remedy, except Step 2.
Fast Rewind does not function properly.	1. Spindle (22) binding.	1. Lubricate.
	2. Supply drive belt (60) slipping.	2. Clean motor pulley and supply pulley (58).
	3. Supply drive belt (60) broken.	3. Remove motor bracket (78) and replace supply drive belt (60).
	4. Set screw (59) loose in supply pulley (58).	4. Tighten set screw (59), leaving 1/32" to 1/16" end play in spindle.
	5. Supply pulley (58) broken.	5. Replace supply pulley (58).
Speed variation, or wow.	1. Slippage.	1. Clean motor pulley, flywheel and capstan (68), and pressure roller (41), with a petroleum solvent, not with carbon tetrachloride. Replace rubber roller if oil-soaked.
	2. Too much feed reel drag.	2. Check adjustments, as described under "Take-up and Feed Reel Drag."
	3. Flat spot on pressure roller (41).	3. A rapid thumping sound while unit is running may indicate a flat spot on rubber roller. If this condition does not clear up after several minutes of running time, replace roller.



A PHOTOFACT "EXPLODED" VIEW
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FIG. 4A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

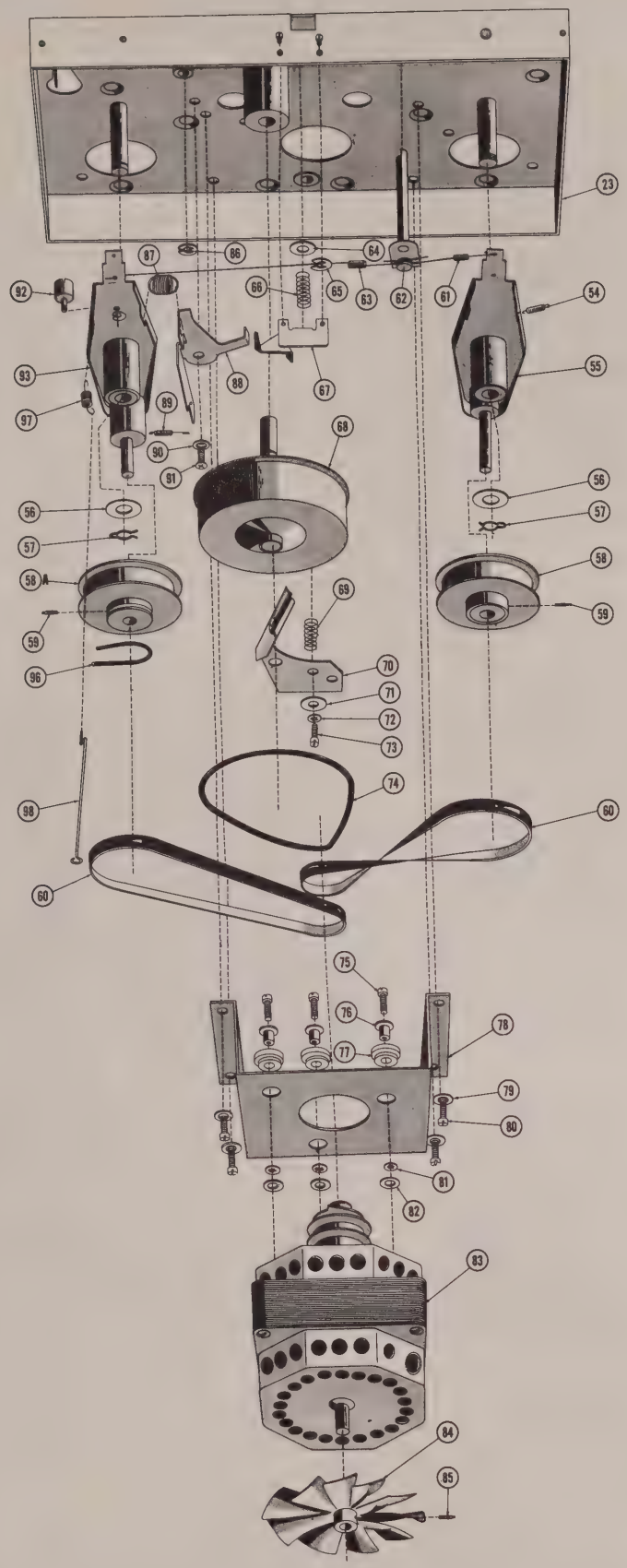
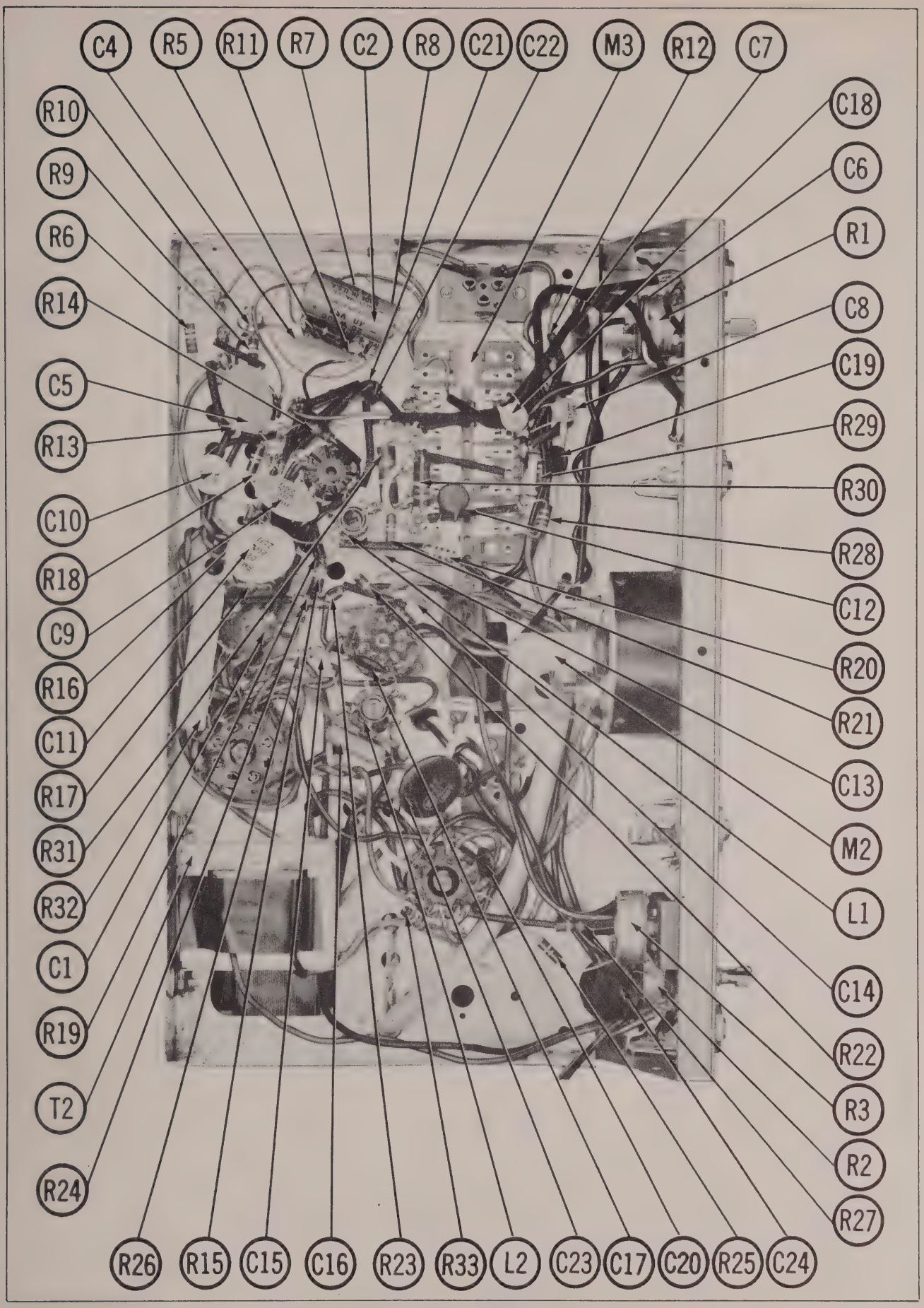


FIG. 4B EXPLODED VIEW OF PARTS BELOW BASEPLATE

Ref. No.	Part No.	Description
1	22-110-0	Reel Plate Retainer
2	84-6067	Reel Plate
3	52-1026-0	Play-Record, Fast Forward & Rewind Knob
4	52-1028-0	Off-On-Volume Tone & Motor Switch Knob
5	97-583	#6-32 x 1/4" Phil. Truss Hd. Screw
6	97-584	#6-32 x 3/8" Phil.Ov. Hd. Screw (2)
7	86-378	Felt Washer
8	31-401-1	Rear Top Cover
9	40-115-0	Front Top Cover
10	56-230	3/8"-32 Hex Nut (4)
11		Spacer (2)
12	44-23-0	Spacer
13	86-265	Fiber Washer (6)
14	97-660	#6 x 5/8" Phil. Rd. Hd. Wood Screw (5)
15	70-264-0	Brake Plate Spring
16	29-114-1	Brake Plate
17	57-604221	#6-32 x 1/4" Phil. Fl. Hd. Screw
18	72-135	Slide Button
19	84-3455	Brake Lever & Pin
20	22-16-4	Interlock Lever
21	70-267-0	Return Spring
22	84-3404	Spindle Ass'y.
23	84-3461	Baseplate
24	70-252-0	Return Spring
25	84-3442	Hub
26	57-604291	#6-32 x 1/4" Phil. Pan Hd. Screw
27	33-272-0	Erase Head (TE-2C)
	*33-273-0	Erase Head (8015)
28	84-3401	Pressure Shoe
29	70-253-0	Pressure Shoe Spring
30	84-3458	Pressure Plate & Spring
31	Part of 35	Take-Up Brake Rod
32	52-1124-0	Record-Edit Button
33	84-3443	Catch
34	22-52-1	Retainer
35	84-6762	Cam & Stud
36	84-6317	Speed Control Knob
37	70-259-0	Compression Spring
38	70-256-0	Plunger Detent Retainer
39	22-40-1	Retainer
40	86-282	Cloth Washer
41	39-1-5	Pressure Roller
42	70-251-0	Slide Return Spring
43	70-258-0	Pressure Roller Spring
44	84-3408	Pressure Roller Arm
45	22-20-4	Drive Link Wire
46	22-37-1	Retainer
47	86-372	Capstan Washer
48	22-15-4	Foot Switch Lever

Ref. No.	Part No.	Description
49	84-3439	Motion Cam
50	84-3404	Spindle Ass'y.
51	57-604271	#6-32 x 1/4" Hex Hd. Screw
52	39-1-2	Tape Indicator
53	84-6007	Record Head & Adaptor
54	70-252-0	Brake Spring (Right)
55	84-3450	Feed Reel Arm
56	86-290 or 86-289	Flatwasher
57	22-42-1	Hairpin Retainer
58	84-6726	Supply Pulley
58A	84-672A	Take-Up Pulley
59	97-577	#6-32 x 3/8" Slab. Hd. Cone Pt. Set Screw
60	62-119-0	Drive Belt
61	70-324-0	Tape Tension Spring (Right)
62	84-6607	Cam & Stud Shaft
63	70-325-0	Tape Tension Spring (Left)
64	86-288	Rubber Washer
65	22-45-1	Retainer
66	70-265-0	Control Shaft Return Spring
67	84-3465	Edit Lever Ass'y. Bracket
68	84-3466	Flywheel & Shaft
69	70-259-0	Compression Spring
70	22-14-4	Belt Transfer Fork
71	86-284	Flatwasher
72	86-45	#6 Int. Tooth Lockwasher
73	57-604291	#6-32 x 1/4" Phil. Pan Hd. Screw
74	62-79-0	Flywheel Belt
75	57-803271	#8-32 x 5/8" Hex Hd. Screw
76	65-123	Eyelet
77	62-74-0	Rubber Grommet
78	84-3407	Motor Bracket
79	86-294	Flatwasher
80	97-567	#8-32 x 3/16" Hex Hd. Screw
81	86-293	#8 Int. Tooth Lockwasher
82	86-292	Flatwasher
83	84-4991	Motor
84	84-4240	Fan
85	97-619	#8 x 3/16" Cup Pt. Allen Hd. Set Screw
86	22-38-1	Retainer
87	70-250-0	Take-Up Spring
88	22-13-4	Take-Up Spring
89	70-257-0	Brake Spring (Left)
90	72-135	Slide Button
91	57-604221	#6-32 x 1/4" Phil. Fl. Hd. Screw
92	39-1-0	Foot Switch Adjustment Cam
93	84-3452	Take-Up Reel Arm
94	52-1022-0	Tape Indicator Knob
95	39-6-3	Motion Shaft (Left)
96	62-80-0	Tape Indicator Drive Belt
97	70-244-0	Foot Switch Return Spring
98	39-5-3	Foot Switch Linkage Wire



AMP CHASSIS 528.59190 BOTTOM VIEW

Ch. 528.59190 PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre Amplifier	12AU7	
V2	AF Amplifier	12AX7	
V3	Meter Amp.-Bias Osc.	12AU7	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	18-36-3		D0032	FP344.4	TMT-150	T-101	R2478 *
B	■40	300			BR3035	TC78	TD-30-350	MT-4540	
C	▲40	300							
C2	25	25	18-52-5	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	39		15-39011			C10Q39U	CN7-439		N750 10%
C4	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C5	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C6	75		15-75011						N1500 10%
C7	10000		15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	75		15-75011						N1500 10%
C9	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C10	1500		15-15211				JL-215		10%
C11	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C12	470		15-47111		MD-470		JL-347		10%
C13	470		15-47111		MD-470		JL-347		10%
C14	1500		15-15211				JL-215		10%
C15	470		15-47111		MD-470		JL-347		10%
C16	1500			1464-0015		1R5D15	MCB-456	MS-215	10%
C17	1000	1000	15-10226	HVD-15-1000	DD-102	BYA10D1M	B-210	5HK-D1	
C18	2000	1000	15-20226		DD-202	BYA10D2	B-220	5HK-D2	
C19	470		15-47111		MD-470		JL-347		10%
C20	1000	1000	15-10226	HVD-15-1000	DD-102	BYA10D1M	B-210	5HK-D1	
C21	10		15-10011	NPO-DI 10	DD-100	L10Q1	CNO-410	5TCC-Q1	
C22	10		15-10011	NPO-DI 10	DD-100	L10Q1	CNO-410	5TCC-Q1	
C23	10000	1500VAC	20-106-0						①
C24	10000	1500VAC	20-106-0						①

① Not used in chassis 528.59191.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	24-271-0	BT-66	A47F3-500K	Q13-133X	UT-427	Volume, Tap ② 100K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Power On-Off
R2A	500K	½	24-143-2	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Motor On-Off
R3	50K	½	24-3-3	BX-31				Meter Adj.
R4	200Ω	2(WW)	24-1-3					Hum Adj.

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R5	1meg		60-10501	
R6	220K		60-22401	
R7	4700Ω		60-47201	
R8	470K		60-47401	
R9	220K		60-22401	
R10	470K		60-47401	
R11	4700Ω		60-47201	
R12	56K		60-56301	
R13	100K		60-10401	
R14	1500Ω		60-15201	
R15	220K		60-22401	
R16	220K		60-22401	
R17	15K		60-15302	
R18	150K		60-15401	
R19	2200Ω		60-22201	

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R20	470K		60-47401	
R21	68K		60-68302	
R22	1meg		60-10501	
R23	1meg		60-10501	
R24	100K 5%		60-10405	
R25	62K 5%		60-62305	
R26	47K		60-47301	
R27	10K		60-10302	
R28	470K		60-47401	
R29	220K		60-22401	
R30	560Ω	1	60-56111	
R31	270Ω	1	60-27111	
R32	1000Ω	10	61-106	
R33	3.9Ω		60-39901	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	52.5KC Trap	10-9-5					
L2	Bias Osc. Coil	10-33-4					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .36A	540VCT ② .050A	6.3V ② 2.1A	80-3-0	P9205	P-3048		PM8403	24R09	R-8B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4600Ω	6-8Ω	80-59-1	Z1001	A-2901①	AU-604 ①	A-3850 ①	24S64 ①	S-53X ①	① Drill new mounting hole.

SPEAKER

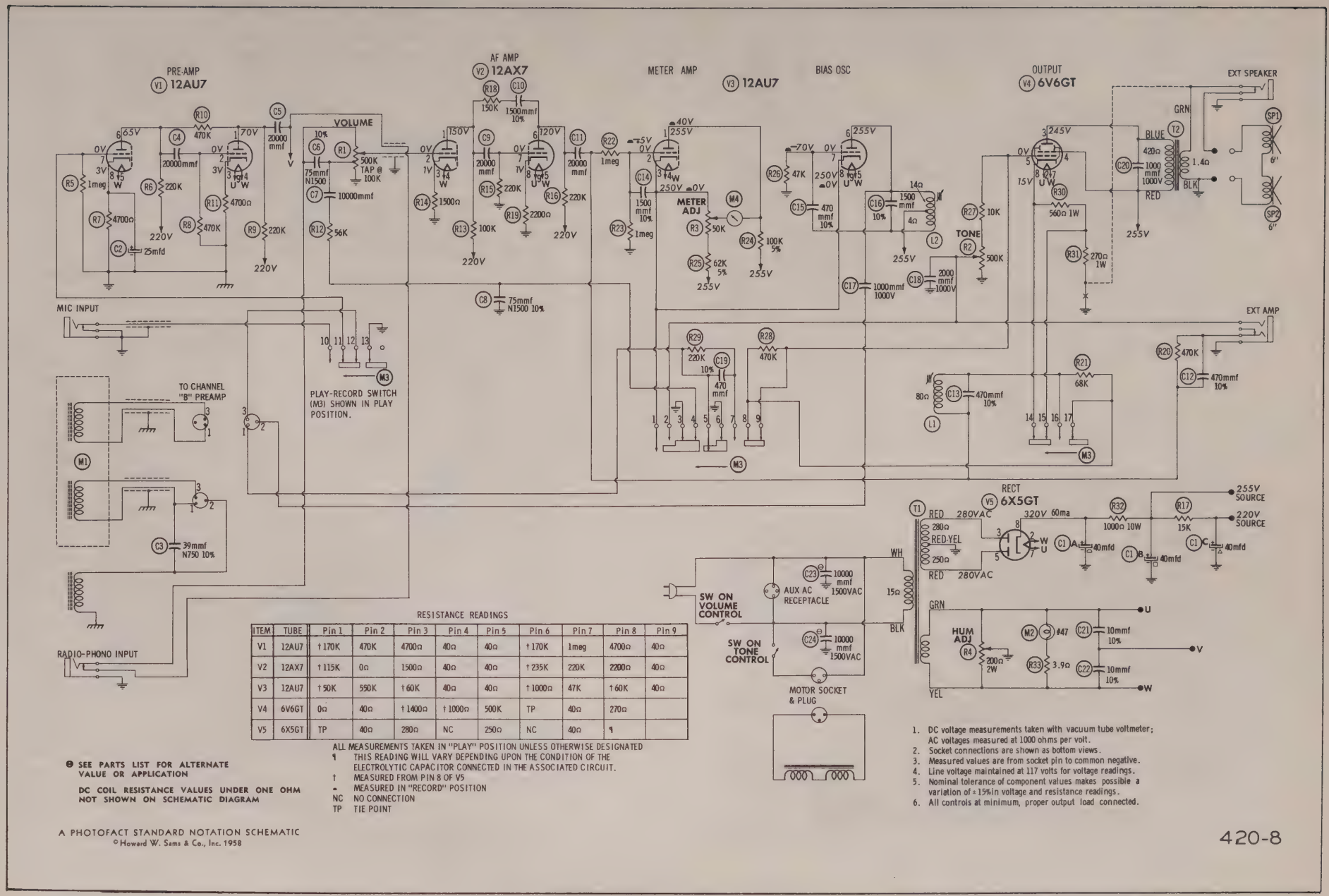
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	33-356-4	6A31	
SP2	6"	PM	3-4Ω	33-309-4	6A31	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Head Assembly	84-4874	Includes Erase Head #33-272-0 (TE-2C) Alternate Part #33-273-0 (8015), Record Head & Adaptor, Part #84-6007
M2	Lamp	89-7	#47
M3	Switch	69-241-0	Includes Slide, Record-Play, Slide Type
M4	Meter	83-1115	Record Level
	Microphone	33-39-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	†170K	470K	4700Ω	40Ω	40Ω	†170K	1meg	4700Ω	40Ω
V2	12AX7	†115K	0Ω	1500Ω	40Ω	40Ω	†235K	220K	2200Ω	40Ω
V3	12AU7	†50K	550K	†60K	40Ω	40Ω	†1000Ω	47K	†60K	40Ω
V4	6V6GT	0Ω	40Ω	†1400Ω	†1000Ω	500K	TP	40Ω	270Ω	
V5	6X5GT	TP	40Ω	280Ω	NC	250Ω	NC	40Ω	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V5
- MEASURED IN "RECORD" POSITION
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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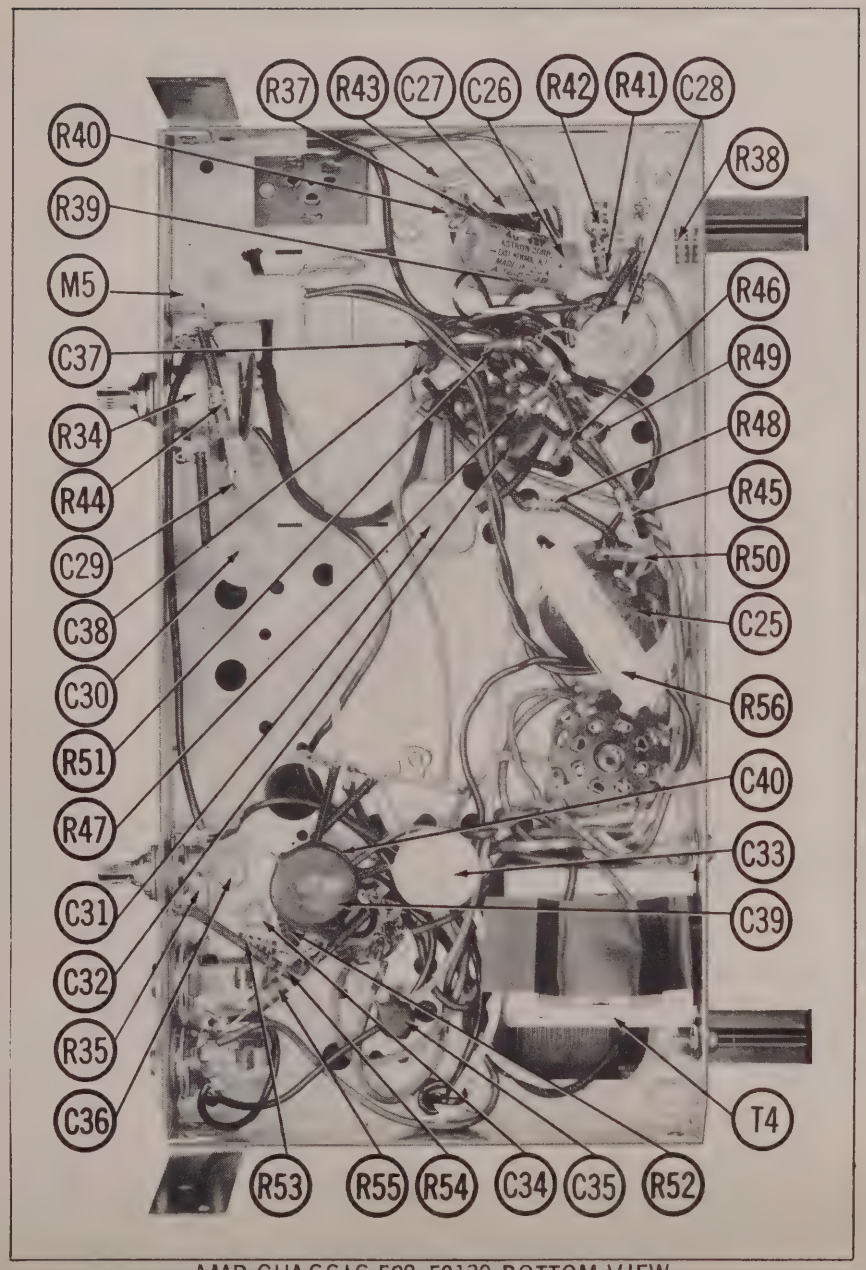
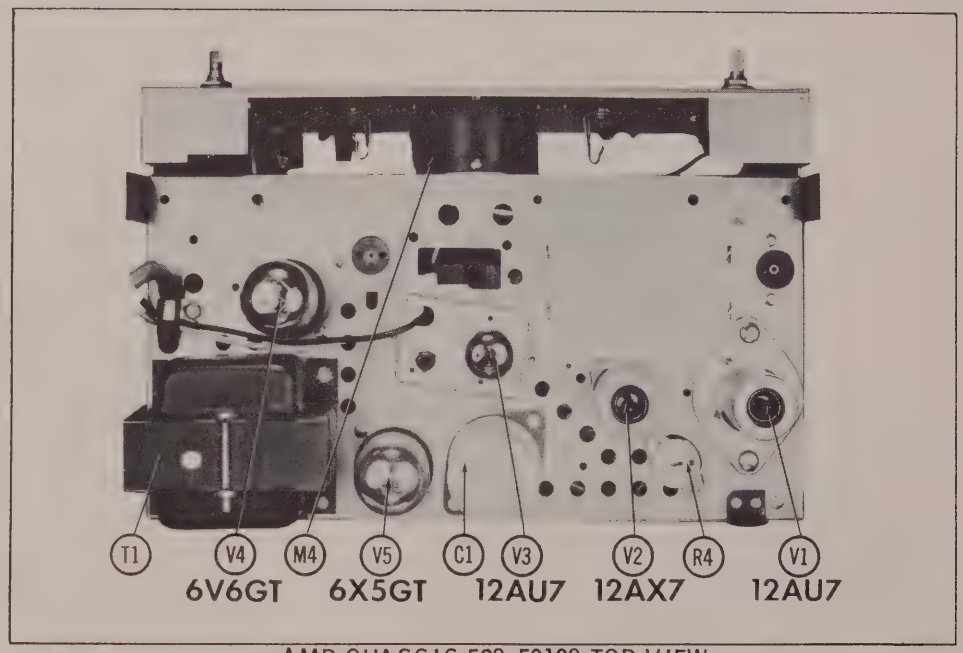
420-8

AMP CHASSIS 528.59190 SCHEMATIC

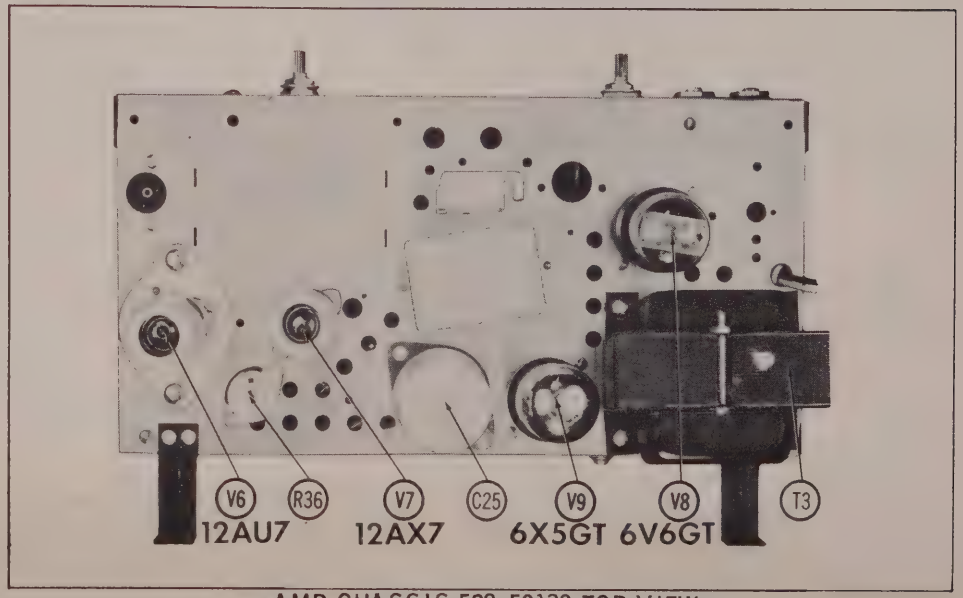
SILVERTONE MODEL 9076
(Ch. 528.58070, 528.59130, 131, 190, 191)



AMP CHASSIS 528.59130 BOTTOM VIEW



AMP CHASSIS 528.59190 TOP VIEW



AMP CHASSIS 528.59130 TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V6	Pre Amplifier	12AU7	
V7	AF Amplifier	12AX7	

ITEM No.	USE	TYPE	NOTES
V8	Output	6V6GT	
V9	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C25A	▲40	350	18-36-3		D0032	FP344.4	TMT-150	T-101	R2478 *
B	■40	300			BR3035	TC78	TD-30-350	MT-4540	
C	▲40	300							
C26	25	25	18-52-5	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C27	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C28	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C29	75		15-75111						N1500 10%
C30	10000		15-10316	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C32	1500		15-15211				JL-215		10%
C33	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-S2	
C34	470		15-47111		MD-470		JL-347		10%
C35	2000	1000	15-20226		DD-202	BYA10D2	B-220	5HK-D2	
C36	1000	1000	15-10226	HVD-15-1000	DD-102	BYA10D1M	B-210	5HK-D1	
C37	10		15-10011	NPO-DI 10	DD-100	L10Q1	CNO-410	5TCC-Q1	10%
C38	10		15-10011	NPO-DI 10	DD-100	L10Q1	CNO-410	5TCC-Q1	10%
C39	10000	1500VAC	20-106-0						①
C40	10000	1500VAC	20-106-0						①

① Not used in chassis 528.49131.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R34A	500K	½	24-271-0	BT-66	A47F3-500K	Q13-133X	UT-427	Volume, Tap ② 100K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Power On-Off
R35A	500K	½	24-162-2	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R36	200Ω	2(WW)	24-1-3					Hum Adj.

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R37	1meg		60-10501	
R38	220K		60-22401	
R39	4700Ω		60-47201	
R40	470K		60-47401	
R41	220K		60-22401	
R42	470K		60-47401	
R43	4700Ω		60-47201	
R44	56K		60-56301	
R45	100K		60-10401	
R46	1500Ω		60-15201	

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R47	220K		60-22401	
R48	220K		60-22401	
R49	150K		60-15401	
R50	15K		60-15302	
R51	2200Ω		60-22201	
R52	68K		60-68302	
R53	470K		60-47401	
R54	10K		60-10302	
R55	270Ω	1	60-27111	
R56	1000Ω	10	61-106	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	117V ② .36A	540VCT ② .050A	6.3V ② 1.7A	80-3-0	P9205	P-3048		PM8403	24R09	R-8B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	4600Ω	6-8Ω	80-59-1	Z1001	A-2901 ①	AU-604 ①	A-3850 ①	24S64 ①	S-53X ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP3	6"	PM	3-4Ω	33-356-4	6A31	
SP4	6"	PM	3-4Ω	33-309-4	6A31	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	Lamp	89-7	#47

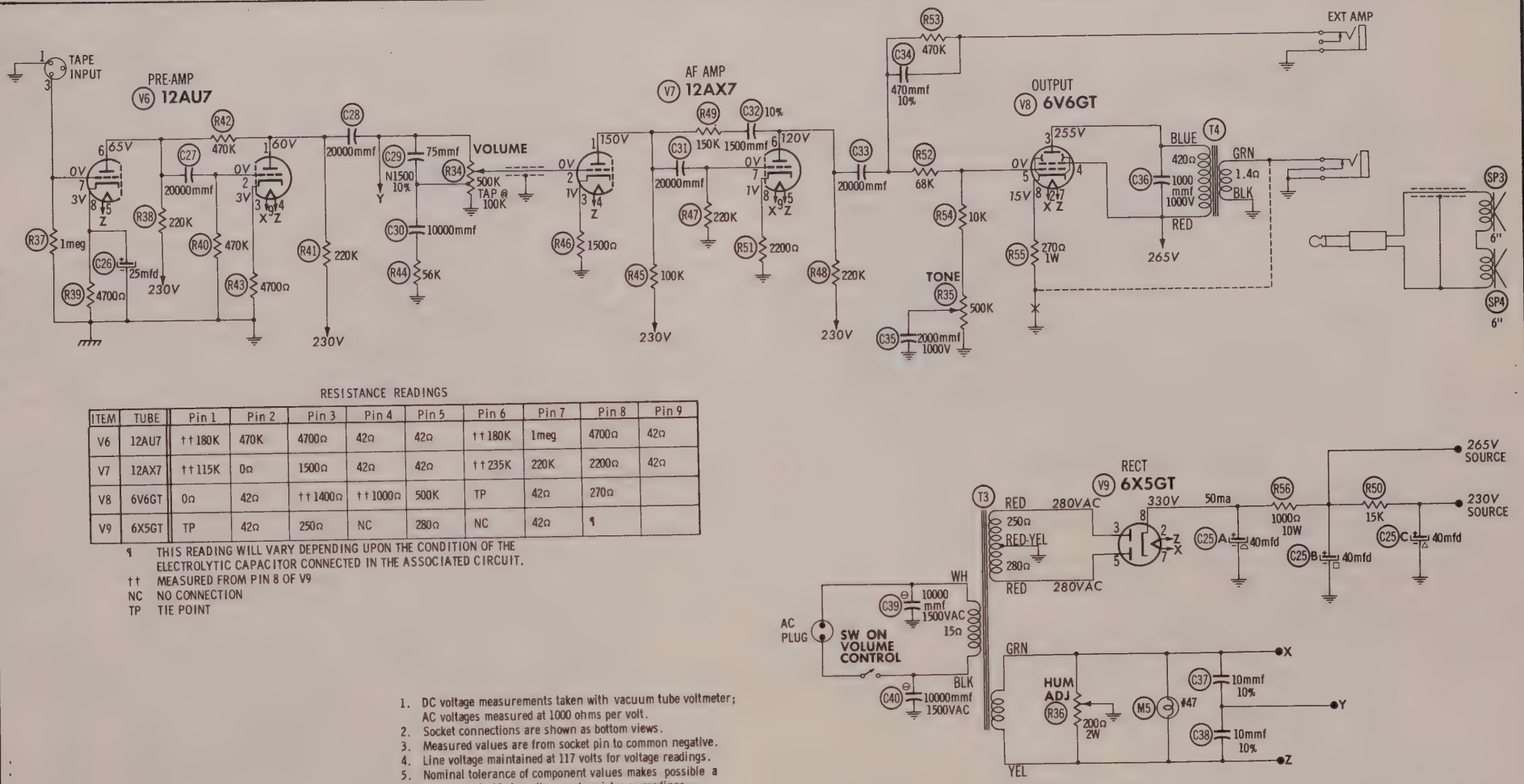
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1026-0	Play-Record, Fast Forward, Rewind, Two used
Knob	52-1028-0	On-Off-Volume, Tone-Motor Power, Four used
Knob	52-1022-0	Indicator
Cabinet	42-26-5	
Handle	49-307	
Indicator	39-1-2	
Dial Assembly	84-3396	
Window	48-144-1	Indicator
Microphone	33-39-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V6	12AU7	††180K	470K	4700Ω	42Ω	42Ω	††180K	1meg	4700Ω	42Ω
V7	12AX7	††115K	0Ω	1500Ω	42Ω	42Ω	††235K	220K	2200Ω	42Ω
V8	6V6GT	0Ω	42Ω	††1400Ω	††1000Ω	500K	TP	42Ω	270Ω	
V9	6X5GT	TP	42Ω	250Ω	NC	280Ω	NC	42Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
†† MEASURED FROM PIN 8 OF V9
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

420-8

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AMP CHASSIS 528.59130 SCHEMATIC

PHOTOFACT* Folder

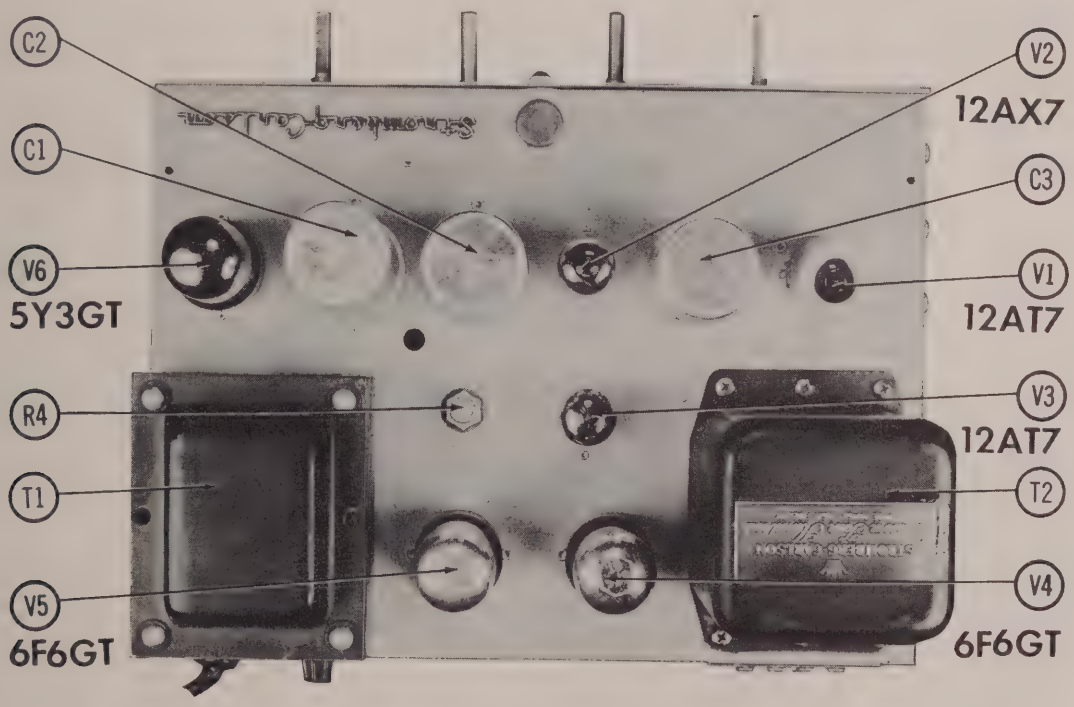
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STROMBERG-CARLSON MODEL AR-415

STROMBERG-CARLSON
MODEL AR-415

TRADE NAME	Stromberg-Carlson Model AR-415
MANUFACTURER	Stromberg-Carlson, National Service Dept., 1400 N. Goodman St., Rochester 3, N.Y.
TYPE SET	AC Operated Audio Amplifier
TUBES (Six)	Types 12AT7 Preamplifier, 12AX7 AF Amplifier, 12AT7 AF Amp.-Phase Inverter, (2) 6F6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC-50/60 Cycles RATING .81 Amp. @ 117 Volts AC (82 Watts)

STROMBERG-CARLSON
MODEL AR-415



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H639

SET 420 FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp.-Phase Inv.	12AT7	
V4	Output	6F6GT	
V5	Output	6F6GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	500	46320	AFH2-72	B0530	FP284	TMD-62	D-275	TVL-2937
B	■30	500							
C2A	▲40	450	35590	AFH4-85-25	D0655	FP431.3		Q-310	TVL-4705.8
B	■30	350							
C	▲15	300							
D	50	50							
C3A	■15	450	111609	AFH4-67	D0890	FP426		Q-305	TVL-4712
B	▲20	450							
C	▲20	25							
D	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C5	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C6	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C7	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S33	
C8	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S33	
C9	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C11	750			SI 750	D6-751	LT6T75	UC-5375	5GA-T75	
C12	750			SI 750	D6-751	LT6T75	UC-5375	5GA-T75	Note 1
C13	.001	400		P488N-001	D6-102	CUB6D1	GEM-421	4TM-D1	Note 2
C14	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C15	27			SI 27	D6-270	LT6Q27	UC-5427	5GA-Q27	
C16	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C17	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S33	
C18	27			SI 27	D6-270	LT6Q27	UC-5427	5GA-Q27	
C19	.0047	400		P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C20	470			SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C21	470			SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C22	.0047	400		P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C23	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S33	
C24	330			SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C25	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C26	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	

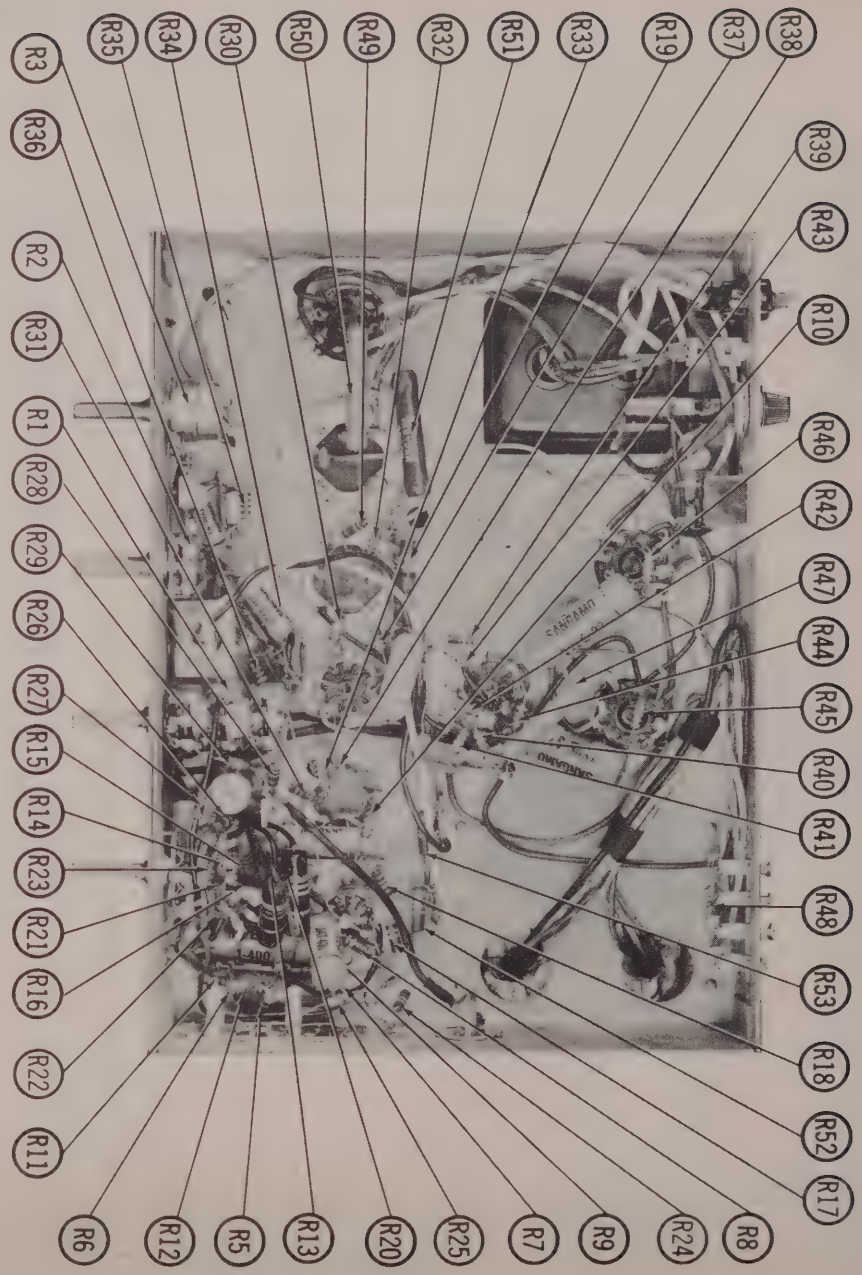
Note 1. Some versions may use .001mfd in this application.
Note 2. Some versions may use 750mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	145622			Q13-133		Loudness
B	1meg	½				M13-137		Loudness
C	100K	½				M13-128		Loudness
R2A	5meg	½	145619	B-88	A47-5meg-Z	Q13-141	U65	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	5meg	½	145621	B-88	A47-5meg-Z	Q13-141	U65	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R4A	100Ω	2(WW)	145632	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Stromberg-Carlson PART No.	NOTES
R5	220K			
R6	47K			
R7	47K			
R8	3.3meg			
R9	68K			
R10	47K			
R11	220K			
R12	10K			
R13	120K			
R14	3.3meg			
R15	3.3meg			
R16	3.3meg			
R17	3.3meg			
R18	68K			
R19	100K	1		
R20	100K			
R21	3.3meg			
R22	3.3meg			
R23	3.3meg			
R24	3.3meg			
R25	470K			
R26	100K			
R27	100K			
R28	10K			
R29	27K			

ITEM No.	RATING OHMS	RATING WATT	Stromberg-Carlson PART No.	NOTES
R30	33K			
R31	330Ω			
R32	47K			
R33	2200Ω			
R34	470K			
R35	470K			
R36	47K			
R37	39K			
R38	1500Ω			
R39	270K			
R40	2200Ω			
R41	12K			
R42	4700Ω			
R43	47K			
R44	47K			
R45	220K			
R46	220K			
R47	350Ω 5%	5		
R48	680Ω			
R49	15K			
R50	2500Ω 5%	5		
R51	25K	10(WW)		
R52	2.7Ω	1		
R53	2.7Ω	1		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .81A	740VCT @ .100A	5V @ 1.8A	161786	P9315	P2954		PM8410	24R05	R-16B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.3A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6000Ω CT	600Ω Taps @ 150Ω 16Ω, 8Ω, 4Ω	161336							
	Turns Ratio	SEC.2								
	10	: 1								

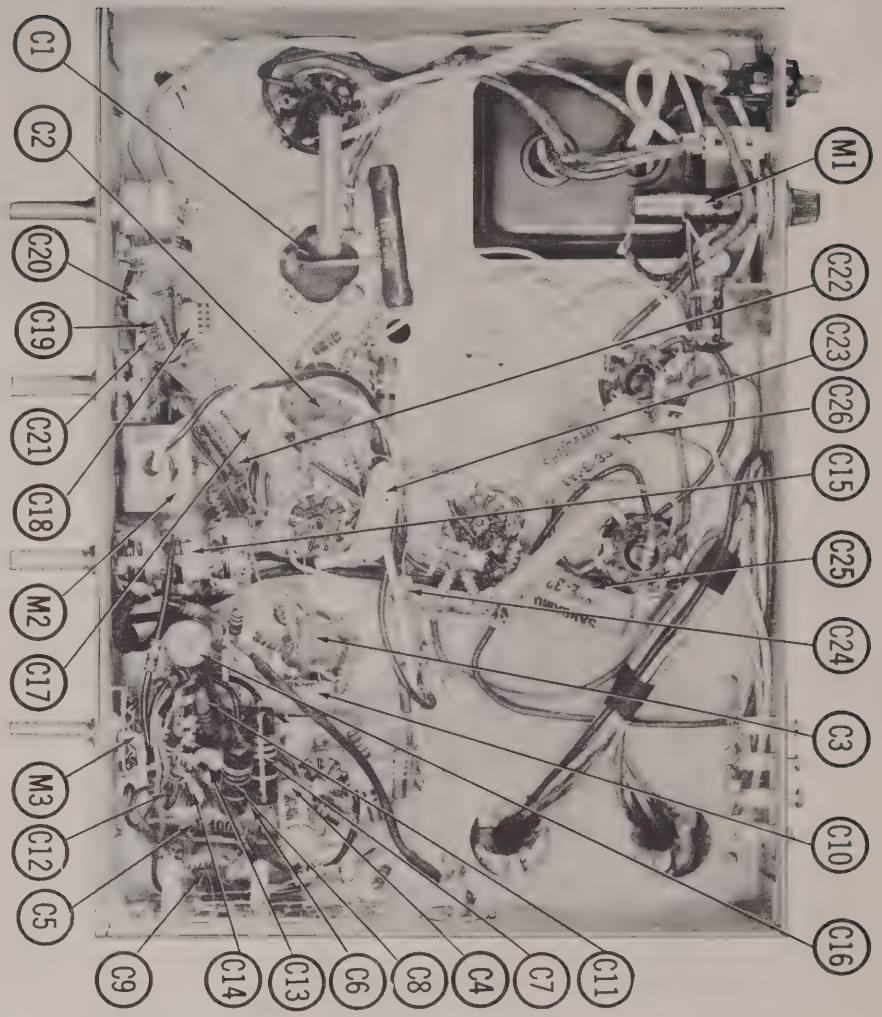
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Stromberg-Carlson PART No. FUSE	Stromberg-Carlson PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 250V			312003. (3AG 3A 250V)	342001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M2	Lamp		#47
M3	Switch	158687	Input Selector, Rotary Wafer Type

CHASSIS—BOTTOM VIEW

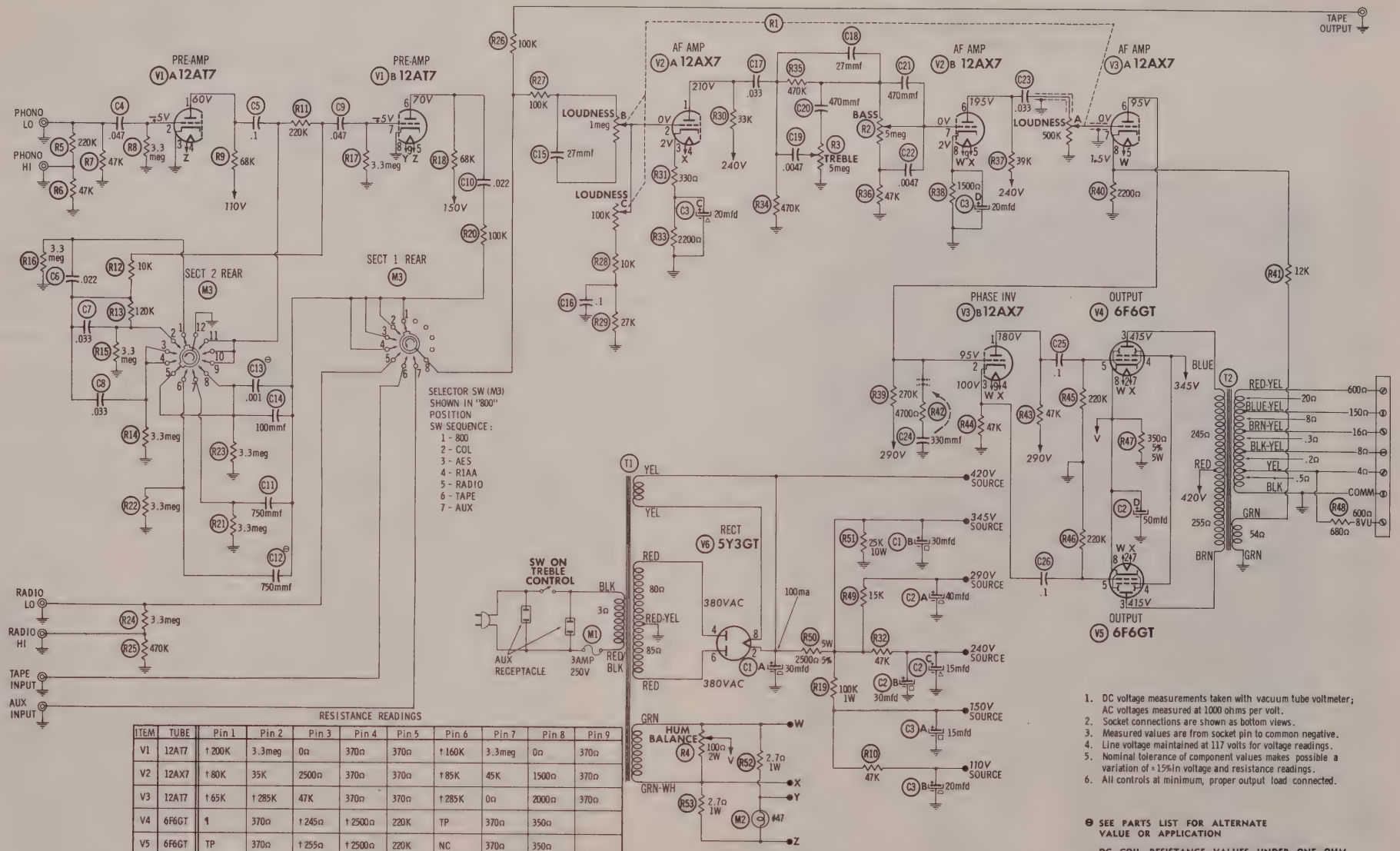


WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

STROMBERG-CARLSON MODEL AR-415

FOLDER 9



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†200K	3.3meg	0Ω	370Ω	370Ω	†160K	3.3meg	0Ω	370Ω
V2	12AX7	†80K	35K	2500Ω	370Ω	370Ω	†85K	45K	1500Ω	370Ω
V3	12AT7	†65K	†285K	47K	370Ω	370Ω	†285K	0Ω	2000Ω	370Ω
V4	6F6GT	¶	370Ω	†245Ω	†2500Ω	220K	TP	370Ω	350Ω	
V5	6F6GT	TP	370Ω	†255Ω	†2500Ω	220K	NC	370Ω	350Ω	
V6	5Y3GT	NC	¶	TP	80Ω	NC	85Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 2 OF V6
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SYLVANIA MODELS 4308, 4309 (Ch. 1-621-1, -2)

SYLVANIA MODELS 4308, 4309 (Ch. 1-621-1, -2)

MODEL 4309

SYLVANIA MODELS 4308, 4309 (Ch. 1-621-1, -2)

TRADE NAME	Sylvania Models 4308 (Ch. 1-621-1), 4309 (Ch. 1-621-2)
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products Inc., 700 Ellicott St., Batavia, N.Y.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12AX7 AF Amplifier, 12AX7 AF Amp. -Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .82 Amp. @117 Volts AC (83 Watts Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER-SEE SYLVANIA 1-318-3 - PHOTOFACT SET 401 FOLDER 13

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H604

SET 420 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AX7	
V2	AF Amplifier-Phase Inv.	12AX7	
V3	Output	6V6GT	
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	450	161-3032	AFH3-131	C1020	FP396	TMT-130	T-675	TVL3741
B	■30	450							
C	▲20	25							
C2A	▲20	350	161-2021	AFH2-69	B0500	FP376.5	TMD-61	D-270	TVL-2935
B	▲20	350							
C3	4	150NP	161-1044	NP-PRS450 V4	BBR8-150 / BBR8-150 †	TC41 / TC41 †	TD-8-150 / TD-8-150 †	MT-1508 / MT-1508 †	R1251 *

† Connect Negative Leads Together. * Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	20000			BPD-02	DD-203	BYA6D2		5HK-S2	
C5	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	220				MD-221	L10T22		5TCC-T22	10%
C7	2000								10%
C8	2000								10%
C9	20000			BPD-02	DD-203	BYA6D2		5HK-S2	
C10	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C11	1000	1000	169-0066	HVD-15-1000	DD-102	BYA10D1	DC3021	5GA-D1	
C12	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C13	.047	400		P488N-047	DF-503	CUB4S47	GEM4147	4TM-S47	
C14	.047	400		P488N-047	DF-503	CUB4S47	GEM4147	4TM-S47	
C15	10			SII0	D6-100	LT6Q1	UC-541	5GA-Q1	
C16	10			SII0	D6-100	LT6Q1	UC-541	5GA-Q1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3 meg	½	152-0043①					Loudness, Tap@500K & 1 meg
B	Shaft							
R2A	1 meg	½	153-0146	B-70	A47-1 meg-Z	Q13-137	U53	Bass
B	Shaft		–	Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1 meg	½	153-0146	B-70	A47-1 meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4	200Ω	2(WW)	153-0144					Hum Balance

①Part #153-0145 (1meg) is used in Model 4308

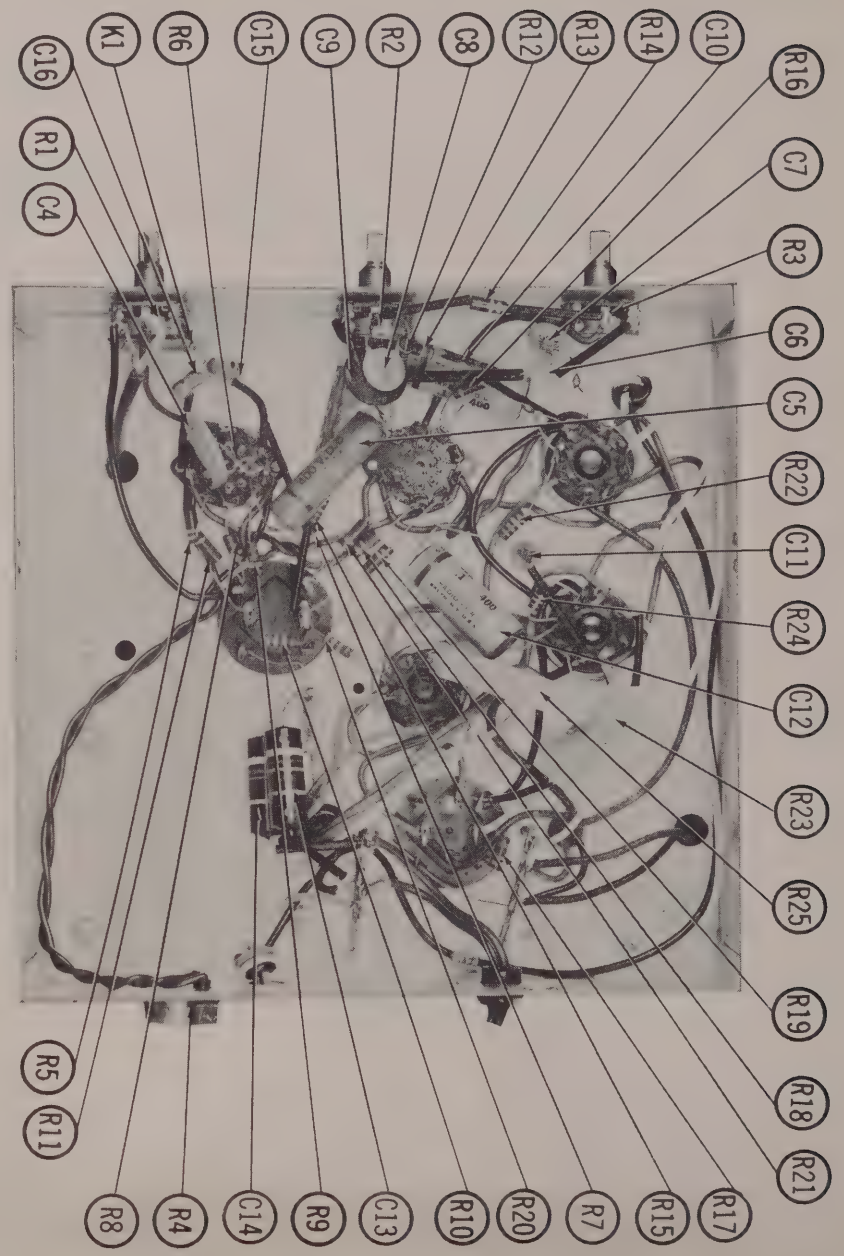
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	NOTES
R5	220K			
R6	100K			
R7	2200Ω			
R8	220K			
R9	220K			
R10	27K			
R11	2200Ω			
R12	47K			
R13	10K			
R14	100K			
R15	220K			

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	NOTES
R16	2200Ω			
R17	15K			
R18	12K			
R19	220K			
R20	27K			
R21	2200Ω			
R22	330K			
R23	300Ω	5(WW)	187-0060	
R24	470K			
R25	500Ω	10(WW)	187-0006	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .82A	740VCT @ .100A	5V @ 1.8A	141-0073 (B80-4-00)		P-2952		PC8409	24R04U	R-11A
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.6A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5800Ω CT	3-4Ω	143-0065	Z1402 ①	A-2935	AU-606	A-3824	24S55	S-55X	①Drill New Mounting Hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP 1	15"	PM	6-8Ω	539-1501①	15A10L	①Used in Model 4309 Only
SP 2	10"	PM	6-8Ω	539-1008①	10A31PA	②Used in Model 4308 Only
SP 3	5"	PM	3-4Ω	539-0508	5A1	
SP 4	5"	PM	3-4Ω	539-0508	5A1	
	12"	PM	6-8Ω	539-1210②		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Tone Comp.	18mmf, 22mmf, 3000mmf, 4700mmf. 47K, 68K, 330K.	190-0042	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SYLVANIA PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	916-0007	53-T	GD-J			Model 4308 (Includes Needle)
	916-0009	53-T	GD-J			Model 4309 (Includes Needle)

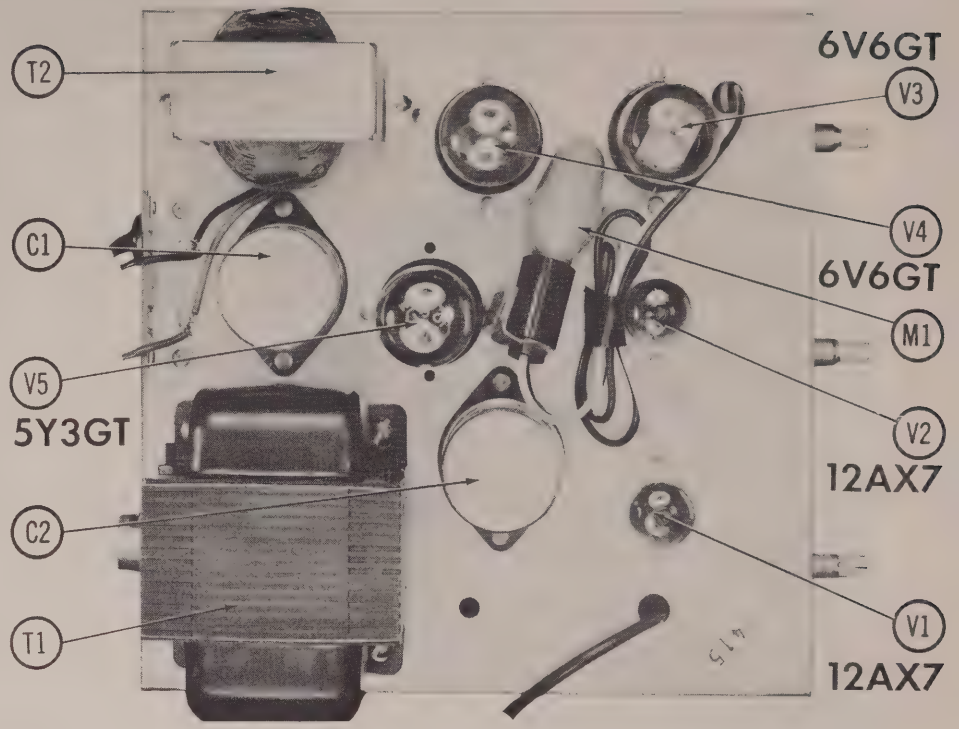
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SYLVANIA PART No.	JENSEN PART No.	WALCO PART No.	
M2	902-0008 ①	† S-66 or † ♦S-66SD or ♦S-66D	† W-75TPS or † ♦W-75DS or ♦W-75TPD	① Model 4308
	902-0009 ②			② Model 4309

† Jewel ♦ Diamond

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Lamp		120V, 7 Watt, Model 4309 Only

CABINETS & CABINET PARTS

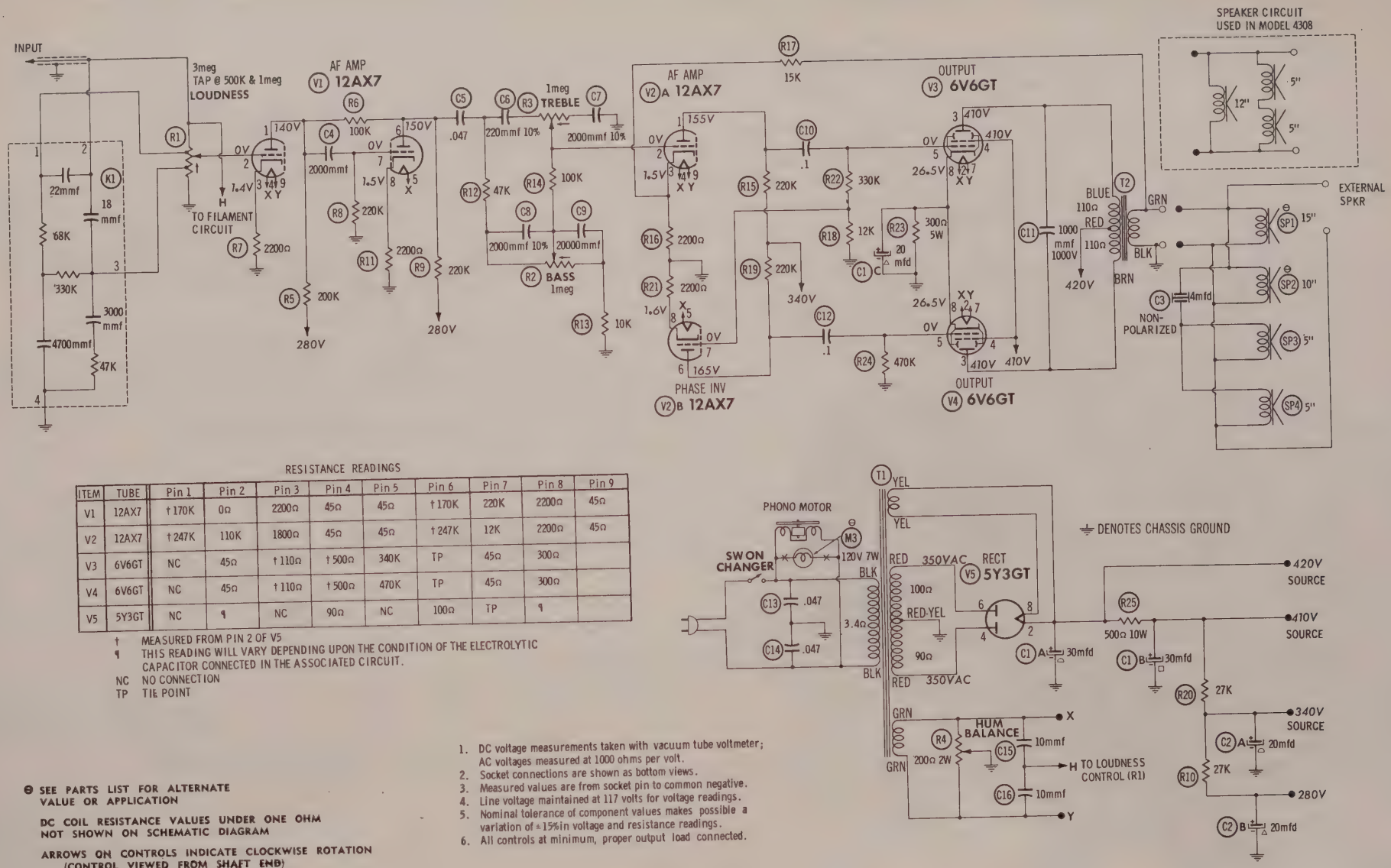
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	740-0180	Loudness, Treble, Bass, Model 4309
Knob	740-0179	Loudness, Treble, Bass, Model 4308

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

SYLVANIA MODELS 4308, 4309 (Ch. 1-621-1, -2)
FOLDER 10



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†170K	0Ω	2200Ω	45Ω	45Ω	†170K	220K	2200Ω	45Ω
V2	12AX7	†247K	110K	1800Ω	45Ω	45Ω	†247K	12K	2200Ω	45Ω
V3	6V6GT	NC	45Ω	†110Ω	†500Ω	340K	TP	45Ω	300Ω	
V4	6V6GT	NC	45Ω	†110Ω	†500Ω	470K	TP	45Ω	300Ω	
V5	5Y3GT	NC	¶	NC	90Ω	NC	100Ω	TP	¶	

† MEASURED FROM PIN 2 OF V5

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

NC NO CONNECTION

TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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TRUETONE MODEL DC3886A

TRUETONE MODEL DC3886A

TRUETONE MODEL DC3886A

TRADE NAME	Truetone Model DC-3886A
MANUFACTURER	Western Auto Supply Co., 2107 Grand Ave. Kansas City, Missouri
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535-1650KC
RATING	7.8MA @ 9 Volts DC (No Signal, Min. Volume) 9MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screw-driver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2 A3	Adjust for maximum output.
2.		Loop	1650KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	540KC	Tuning gang fully closed	"	A5	"
4.		"	1400KC	Tune to 1400KC signal	"	A6	"
5.		"	600KC	Tune to 600KC signal	"	A5	Adjust for maxumum output while rocking tuning capacitor thru 600KC signal.

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H599

SET 420 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N486	Converter		2N411	2N486	2N409	PNP
X2	2N483	1st IF Amplifier		2N409	2N483	2N413A	PNP
X3	2N483	2nd IF Amplifier		2N409	2N483	2N413A	PNP
X4	CK872	Driver		2N407	CK872/2N362	2N381	PNP
X5	CK878	Output		2N270	CK878/2N360	2N382	PNP
X6	CK878	Output		2N270	CK878/2N360	2N382	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Truetone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	12	①	XPP-12040	NL50-10	TT15X40	ML40-15		R2329*
C2	40	12	①	XPP-12040	NL50-10	TT15X40	ML40-15		R2329*
C3	40	12	②	XPP-12040	NL50-10	TT15X40	ML40-15		R2329*
C4	12	12	150-132	XPP-12015	NL15-25	TT12X10	ML10-15		TE-1156
C5	40	12	①	XPP-12040	NL50-10	TT15X40	ML40-15		R2329*

① Some versions may use 50mfd in this application (Part #150-134).
② Some versions may use 12mfd in this application (Part #150-132).
* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Truetone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	50000		158-111	BPD-05	DDA-503				
C7	50000		158-111	BPD-05	DDA-503				
C8	50000		158-111	BPD-05	DDA-503				
C9	50000		158-111	BPD-05	DDA-503				NPO 5%
C10	14		158-116						
C11	50000		158-111	BPD-05	DDA-503				
C12	50000		158-111	BPD-05	DDA-503				
C13	50000		158-111	BPD-05	DDA-503				NPO 5%
C14	4.7		158-115						
C15	50000		158-111	BPD-05	DDA-503				
C16	50000		158-111	BPD-05	DDA-503				
C17	50000		158-111	BPD-05	DDA-503				

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Truetone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	10K	½	120-134	B-15	A47-10K-Z	Q13-116	U18	Volume
B	Shaft			Not Req.	KES-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1 *	SWE-12	76-1	US-26	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

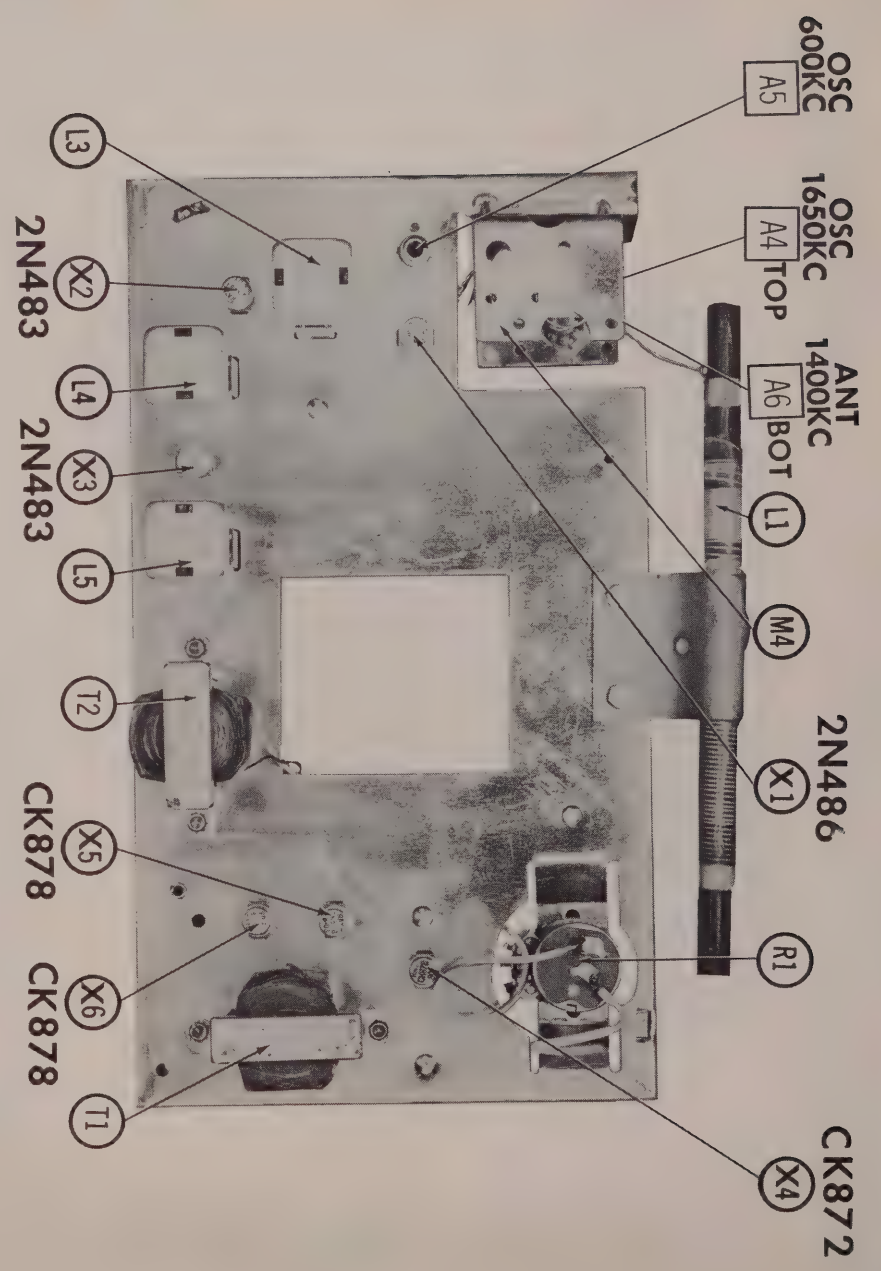
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Truetone PART No.	NOTES
	OHMS	WATT		
R2	6800Ω		180-194	
R3	18K		180-152	
R4	1000Ω		180-186	
R5	3900Ω 5%		180-195	
R6	12K		180-121	
R7	3300Ω		180-158	
R8	560Ω		180-196	
R9	4700Ω 5%		180-183	
R10	27K		180-193	
R11	1000Ω		180-186	
R12	220K		180-197	
R13	8200Ω		180-198	
R14	47K		180-200	
R15	680Ω		180-199	
R16	150Ω			Note 1
R17	8200Ω		180-198	
R18	4.7Ω		180-201	
R19	470Ω		180-188	

Note 1. Some versions may use 120Ω in this application (Part #180-145).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Truetone PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	132-138					
L2	Osc. Coil	136-140					
L3	1st IF Trans.	130-131					
L4	2nd IF Trans.	130-132					
L5	3rd IF Trans.	130-133					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Truetone PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3	1	138-128			TA-6①			① Drill new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Truetone PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	307Ω CT	3-4Ω	138-129					TR-22 ①	TY-57X①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Truetone PART No.	QUAM PART No.	
SP1	6½"	PM	3-4Ω	175-136	6A21	

BATTERIES

ITEM No.	VOLTAGE	Truetone PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	3B6731 ①		1 ①		935 ①		M-14 ①	① 6 Used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Truetone PART No.	CBS PART No.	SYLVANIA PART No.	
M2	IN295		IN60	IN295	Detector (Pigtail)
M3	IN295		IN60	IN295	Overload (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Truetone PART No.	NOTES
M4	Tuning Cap.	160-129	2 Gang (Ant. 23-270mmf, Osc. 23-126mmf)
	Earphone	3DW5300	

CABINETS & CABINET PARTS

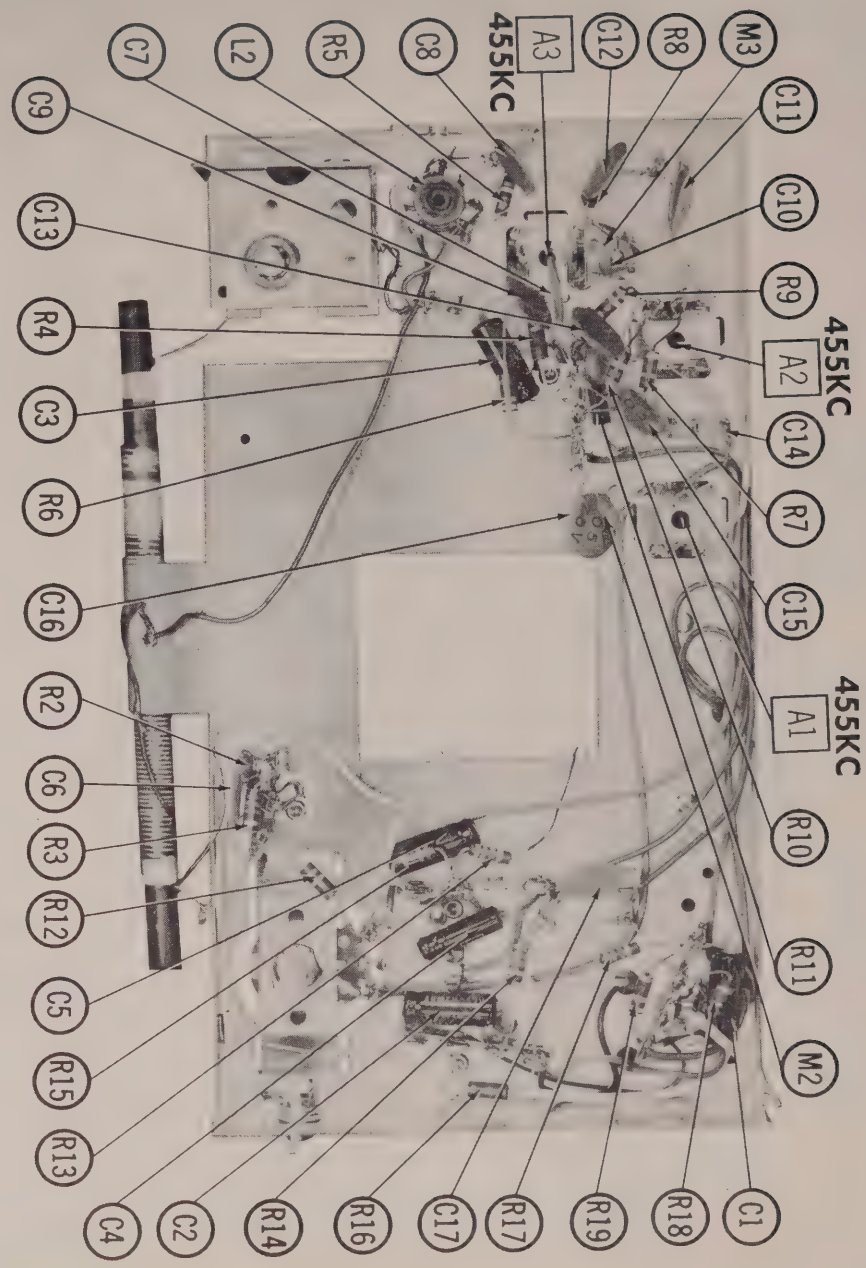
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

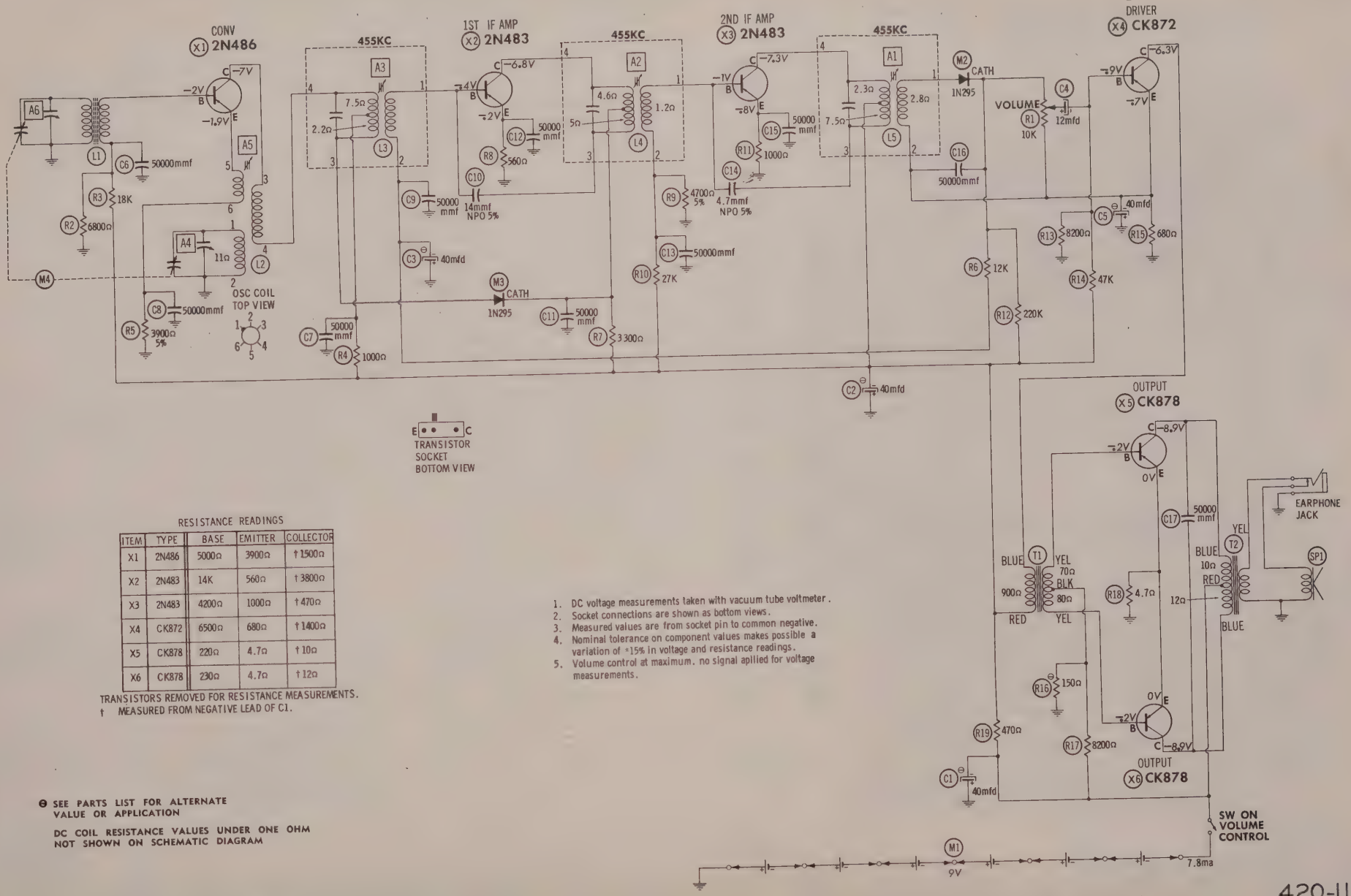
NAME	PART NO.	DESCRIPTION
Knob	220-152	Tuning, On-Off-Volume
Cabinet	210-147	
Battery Case	195-197	Bottom Section, Includes Contact Springs
Battery Case	195-196	Top Section

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N486	5000Ω	3900Ω	†1500Ω
X2	2N483	14K	560Ω	†3800Ω
X3	2N483	4200Ω	1000Ω	†470Ω
X4	CK872	6500Ω	680Ω	†1400Ω
X5	CK878	220Ω	4.7Ω	†10Ω
X6	CK878	230Ω	4.7Ω	†12Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM NEGATIVE LEAD OF C1.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal apllied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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420-11

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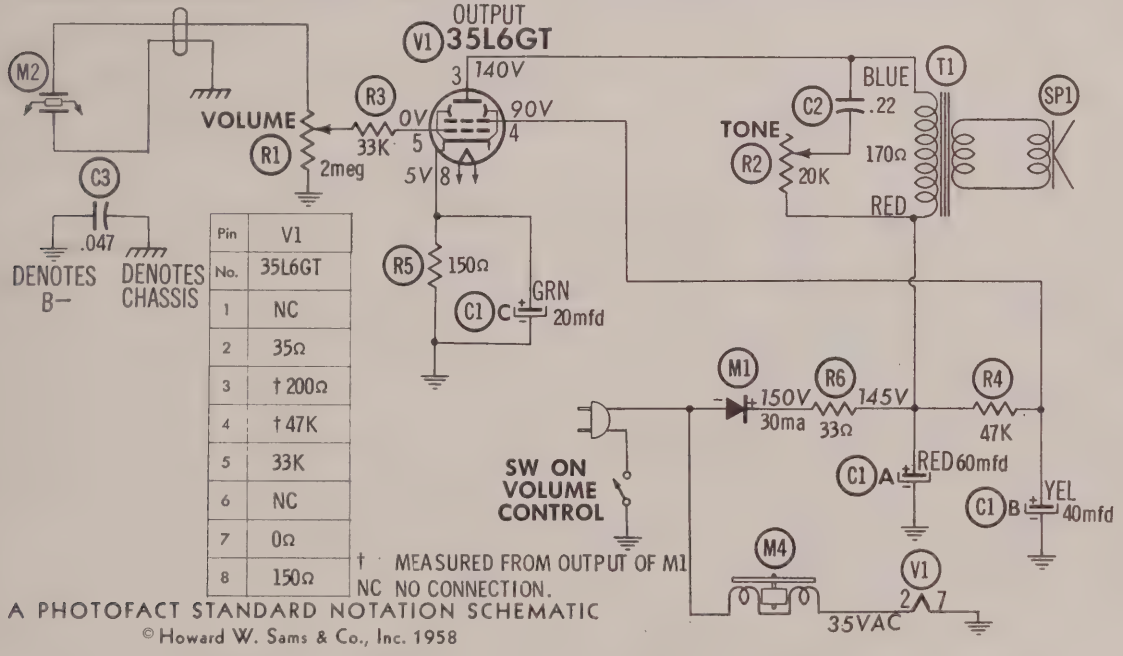
EIA

V-M MODEL 215

V-M
MODEL 215

TRADE NAME	V-M Model 215	
MANUFACTURER	V-M Corp., Benton Harbor, Michigan	
TYPE SET	AC Operated Phono Amplifier With 4 Speed Manual Record Player	
TUBES (One)	Type 35L6GT Output	
POWER SUPPLY	105-120 Volts AC-60 Cycles	RATING .28 amp. @ 117 Volts AC (25 Watts)



Pin	V1
No.	35L6GT
1	NC
2	35Ω
3	† 200Ω
4	† 47K
5	33K
6	NC
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H616

SET 420 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	35L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	12024	PRS150/25V 8040/20	BBRT8415C	TCT3116	TDLT-7	FMT-333	R2451 *
B	40	150							
C	20	25							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.22	400	12052	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C3	.047	600	12073	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	12320	B-76	A47-2meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Tone
R2A	20K	1/2	12321	B-24		Q13-120	U24	
B	Shaft			Not Req.		Not Req.	Not Req.	

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		V-M PART No.	NOTES
	OHMS	WATT		
R3	33K		11093	
R4	47K		11133	

ITEM No.	RATING		V-M PART No.	NOTES
	OHMS	WATT		
R5	150Ω		19533	
R6	33Ω		10373	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω	3-4Ω	Part of Spkr.	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

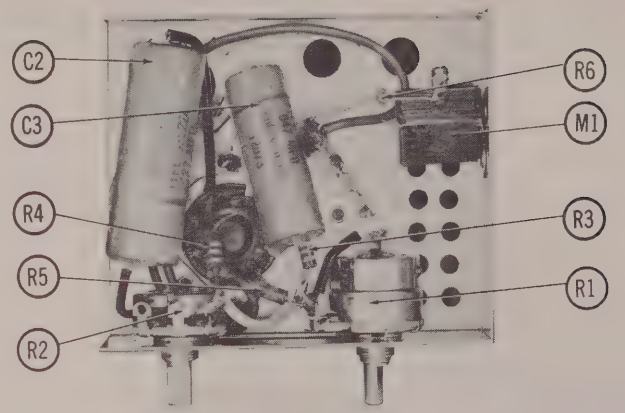
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	V-M PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	7939 ①	4A07	① Includes T1

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	V-M PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.031A	12526	1234AH	RS065	65A K200 ①	① Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	V-M PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	14626	310-TS	N8-1 & N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	JENSEN PART No.	WALCO PART No.	
M3	14627 (LP)	†CRA-55LP or ♦CRA-55LPD	†W-64MGS or ♦W-64MGD	† Jewel ♦ Diamond
	14628 (78RPM)	†CRA-55 or ♦CRA-55D	†W-64S or ♦W-64D	

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Motor	6491	Phono

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	14622	On-Off-Volume, Tone (2 Used)
Knob	14629	Cartridge
Case	14615	Add suffix letter "A" (for red), "B" (blue); "C" (green)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA

WILLYS MODEL
815395

WILLYS MODEL
815395

TRADE NAME	Willys Model 815395 (For Willys Automobiles)
MANUFACTURER	Delco Radio, Div. of G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 12V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 2.4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

WILLYS MODEL
815395

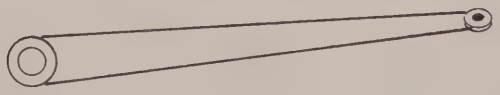
ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to Pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400~ Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Osc. Coil Core (A5). Rear of core should be 1 25/32" from mounting end of coil form.						
2.	82mmf	High side to antenna receptacle. Low side to chassis.	1615KC	"	"	A6, A7, A8	Adjust for maximum output.
3.	"	"	1000KC	Tune to 1000KC signal	"	A9, A10	"
4.	"	"	1615KC	High frequency end stop	"	A7, A8	"
5.	With radio tuned to a 900KC signal, slide pointer on dial cord to coincide with 900KC mark on dial.						
	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC. Adjust A8 for maximum output.						

DIAL CORD STRINGING



8 TURNS ON TUNING SHAFT

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SET 420 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det. -AVC-AF Amp.	12AV6	
V5	Output	12V6GT	
V6	Rectifier	0Z4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 20	400	7262905	AFH2-51	B0400	FP234	TMD-50	D-215	TVL-2755
B	▲ 20	400							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2A	7-102		7262799						
B	33								
C3	.05	400	6512	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C4	.05	400	6512	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C5A	10		G-100						Note 1
B	39		G-390						
C6A									
B			7242454						
C									
D									
C7	180		7257424						N150
C8	2000		6528	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C9	.01	600	6533	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C10	.01	600	6533	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	Note 2
C11	2000		6528	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	Note 3
C12	.006	800	H-602	P1088N-006	DD16-602	CUB10D6	GEM-1028	10TM-D6	
C13	.008	1600	6568	P1688N-008	DD16-802	CUB16D8	GEM-1628	M13-D8	
C14	.1	200	6690	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C15			1217848						

Note 1. Some versions may use 15mmf in this application (Part #6361).
Note 2. Some versions may use .05mfd in this application (Part #6512).
Note 3. Some versions may use 1000mmf in this application (Part #6527).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	7264211				♦ QJ-698A	Tone
B	300K	1/2						Volume
	Switch							

♦ "Concentrikit" Equivalent; K-8 Kit, Base Elements & Shafts: B-13-129, P14-204 Panel B-13-132, R1-234 Rear 76-2 Switch

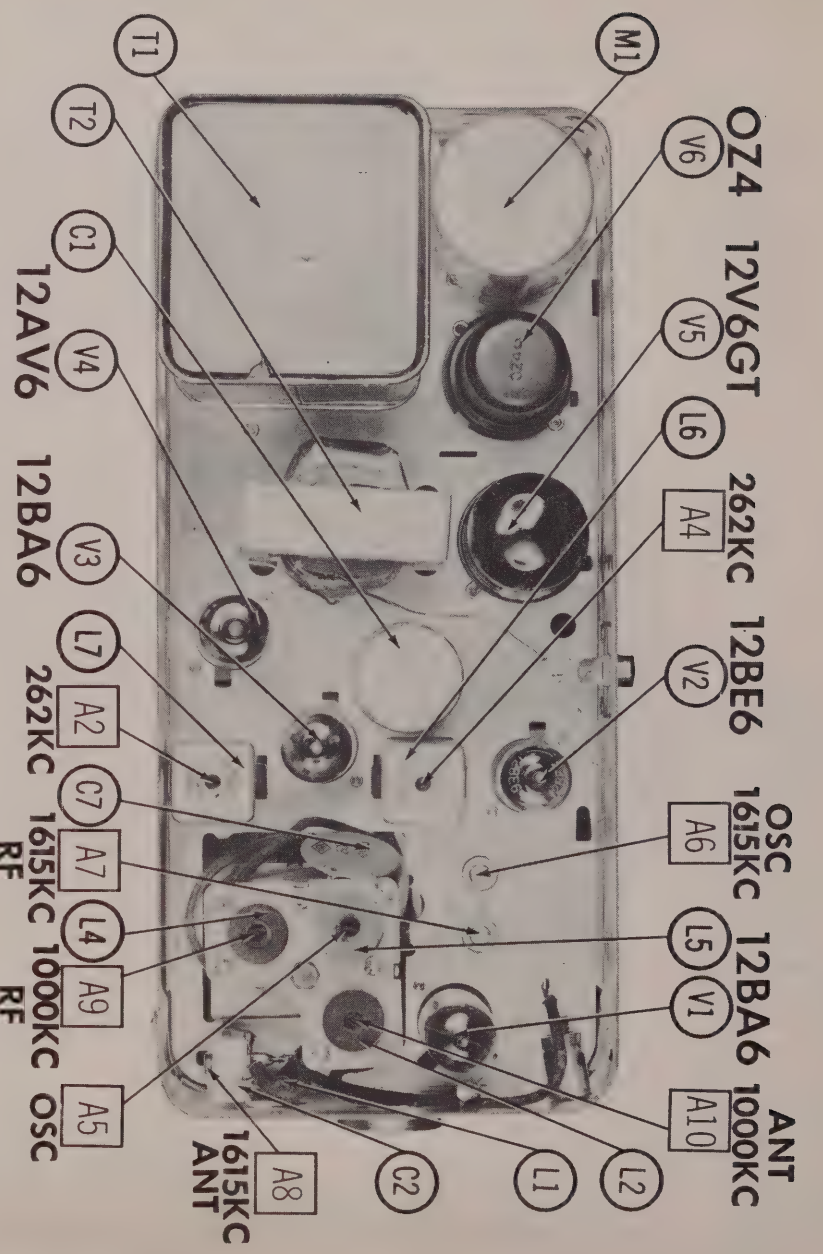
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		DELCO PART No.	NOTES
	OHMS	WATT		
R2	2.2meg		A-225	
R3	15K	1	B-153	
R4	15K	2	C-153	
R5	100Ω		A-101	
R6	330K		A-334	
R7	22K		A-223	
R8	150Ω		A-151	
R9	1meg		A-105	
R10	47K		A-473	
R11	6.8meg		1244	
R12	220K		A-224	
R13	220K		A-224	
R14	330Ω	1(WW)	1156	Note 1
R15	15K	1	B-153	
R16	1800	2(WW)		Note 2

Note 1. Some versions may use 390Ω 1W in this application (Part #B-391).
Note 2. Manufacturer recommends replacing with 2700Ω 2W (Part #C-272) and 5600Ω 1W (Part #B-562) connected in parallel.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		DELCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	7255738	19-1004	BC-565	4610		6.5 microhenries
L2	Ant. Coil	7258914					
L3	RF Choke	7240251					25 microhenries
L4	RF Coil	7258914					
L5	Osc. Coil	7258911					
L6	Input IF	1218725	16-6752	BC-350	12-H1	RF-3	
L7	Output IF	1218726	16-6754	BC-354	12-H6		
L8	Fil. Choke	1217846					1.4 microhenries

TRANSFORMER (VIBRATOR)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @1.8A	600VCT @.054A		1220867						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	3-4Ω	6062	Z1002①	A-3019①		A-3823①	26S49①	S-5Z①	① Use original channel frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	7270369	6A15	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				DELCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6 VDC	115∿	8550	6330	G-874	6330	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		7½A. 32V	7263227	1220177				

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M3	Lamp		#57
M4	Spark Plate	1221226	

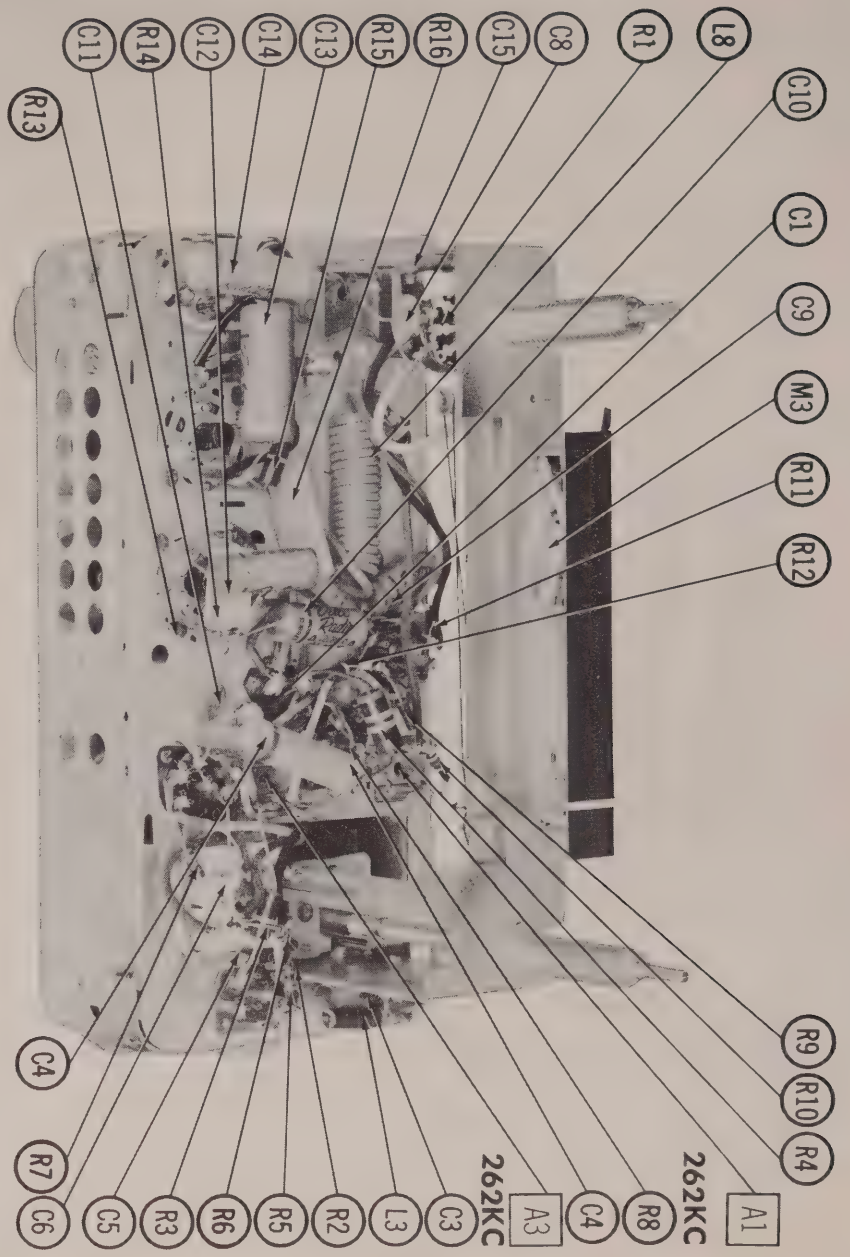
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

CHASSIS—BOTTOM VIEW

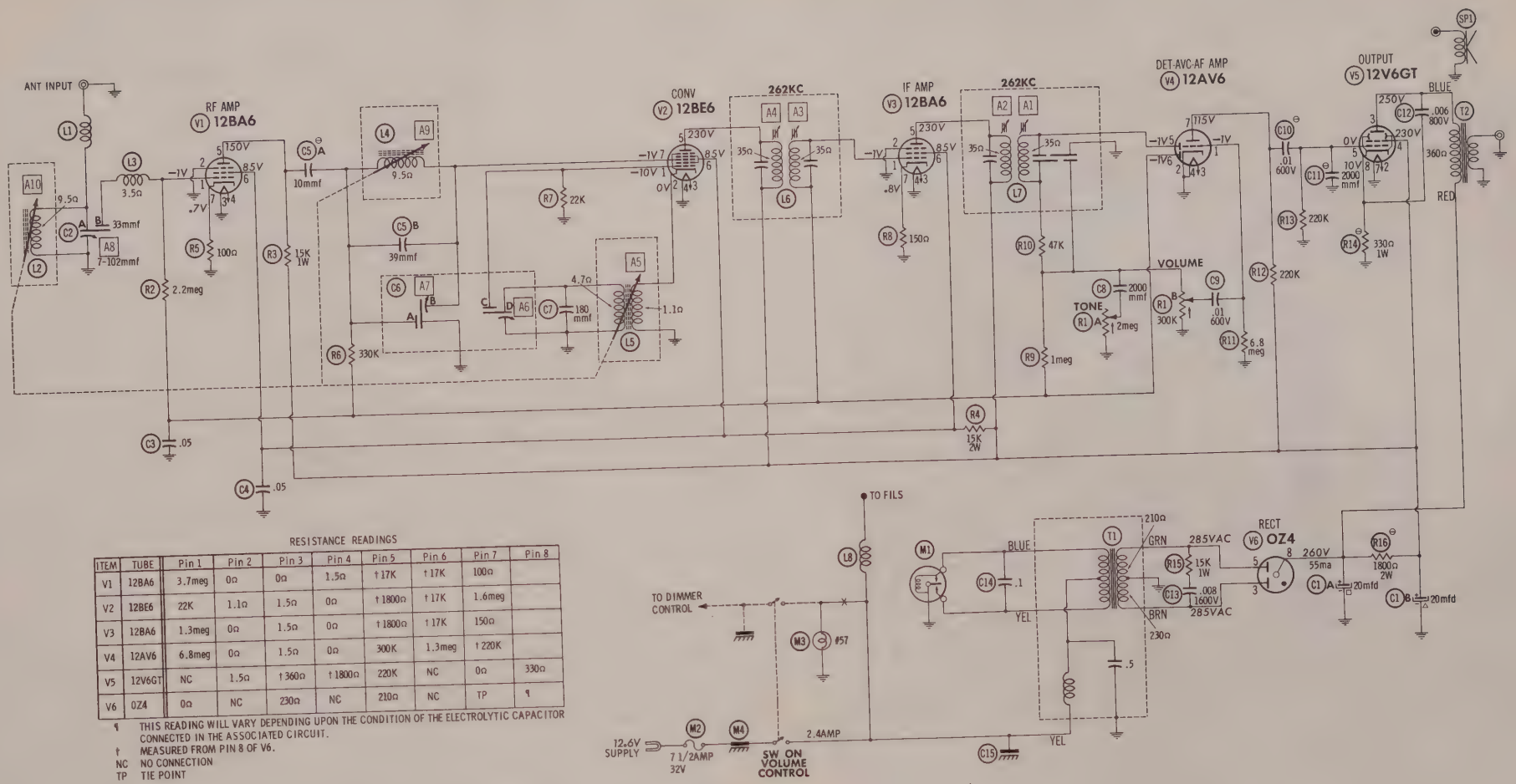


WILLYS MODEL 815395

SET 420 FOLDER 13

WILLYS MODEL 815395

FOLDER 13



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12BA6	3.7meg	0Ω	0Ω	1.5Ω	†17K	†17K	100Ω	
V2	12BE6	22K	1.1Ω	1.5Ω	0Ω	†1800Ω	†17K	1.6meg	
V3	12BA6	1.3meg	0Ω	1.5Ω	0Ω	†1800Ω	†17K	150Ω	
V4	12AV6	6.8meg	0Ω	1.5Ω	0Ω	300K	1.3meg	†220K	
V5	12V6GT	NC	1.5Ω	†360Ω	†1800Ω	220K	NC	0Ω	330Ω
V6	0Z4	0Ω	NC	230Ω	NC	210Ω	NC	TP	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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420-13

PHOTOFACT* Folder

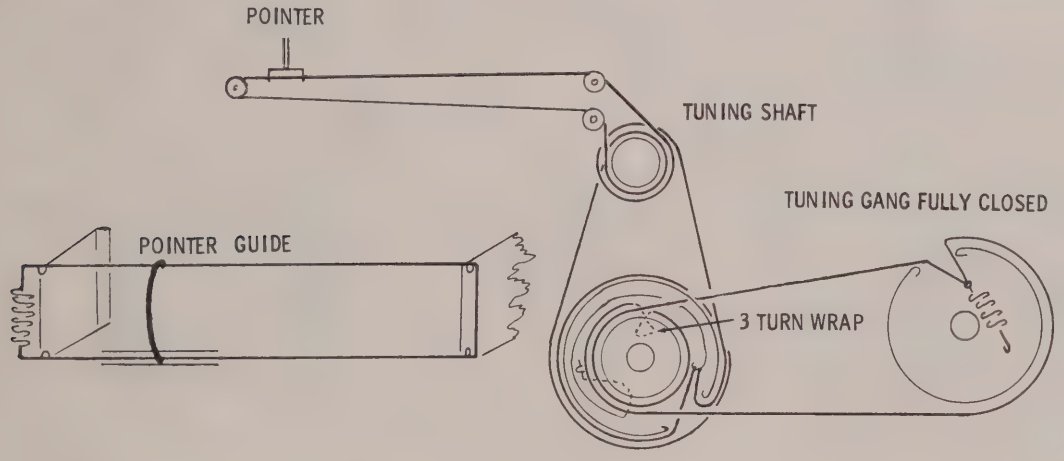
EIA MEMBER

ZENITH MODEL
Royal 1000

ZENITH MODEL
Royal 1000

ZENITH MODEL
Royal 1000

TRADE NAME	Zenith Royal 1000			
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois			
TYPE SET	Battery Operated 8 Band BC-SW Portable Transistorized Receiver			
POWER SUPPLY	12 Volts DC	RATING	13.5MA @ 12 Volts DC	
TUNING RANGES	BROADCAST	540-1600KC	SHORT WAVE IV	11.4-12.3MC
	SHORT WAVE I	2-4MC	SHORT WAVE V	14.6-15.8MC
	SHORT WAVE II	4-9MC	SHORT WAVE VI	17.1-18.5MC
	SHORT WAVE III	9.4-10.1MC	SHORT WAVE VII	20.7-22.5MC



DIAL CORD STRINGING

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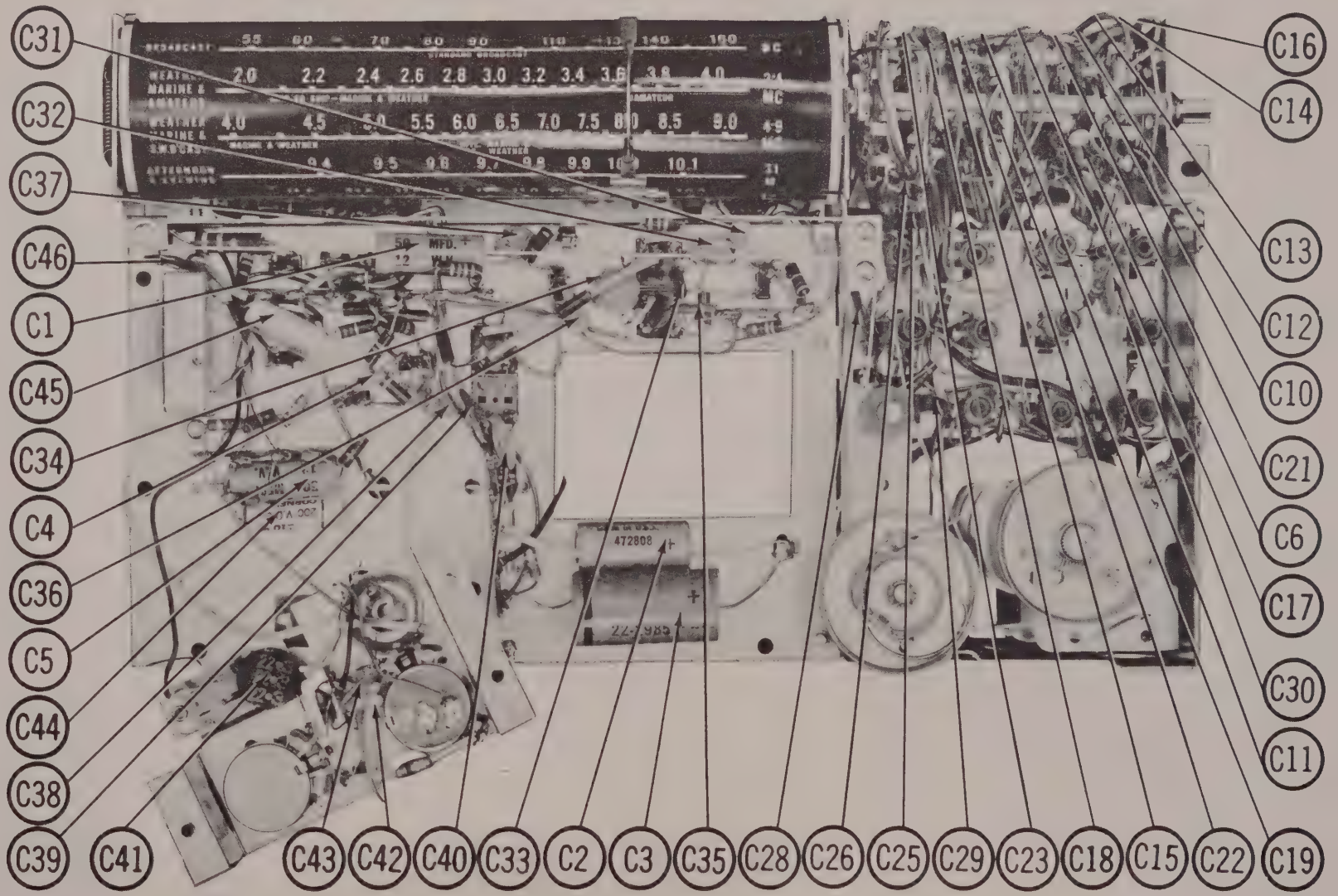
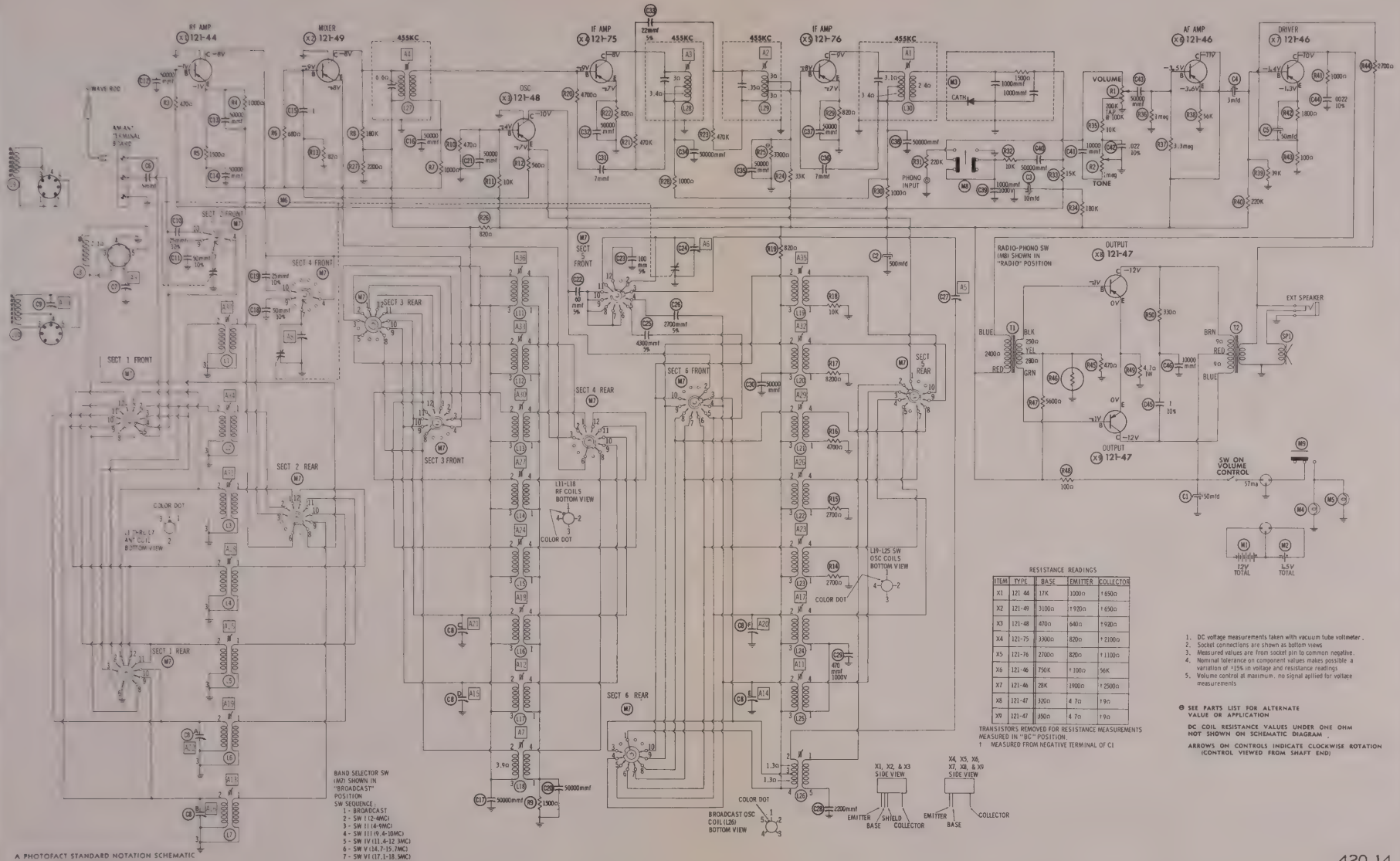
H651

SET 420 FOLDER 14



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	121-44	17K	1000Ω	†650Ω
X2	121-49	3100Ω	†920Ω	†650Ω
X3	121-48	470Ω	640Ω	†920Ω
X4	121-75	3300Ω	820Ω	†2100Ω
X5	121-76	2700Ω	820Ω	†1100Ω
X6	121-46	750K	†100Ω	56K
X7	121-46	28K	1900Ω	†2500Ω
X8	121-47	320Ω	4.7Ω	†9Ω
X9	121-47	350Ω	4.7Ω	†9Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS MEASURED IN "BC" POSITION.
† MEASURED FROM NEGATIVE TERMINAL OF C1

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
5. Volume control at maximum, no signal applied for voltage measurements

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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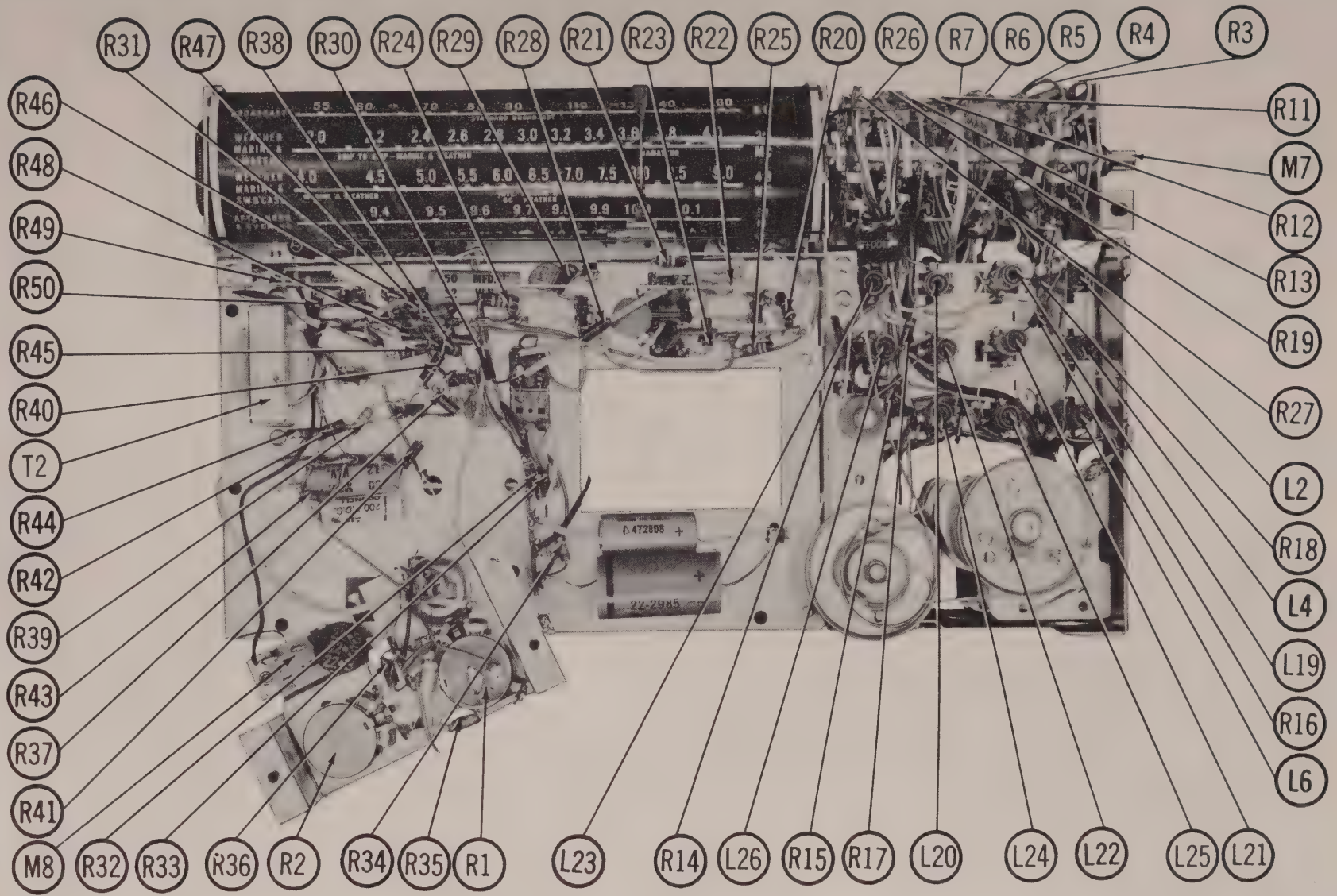
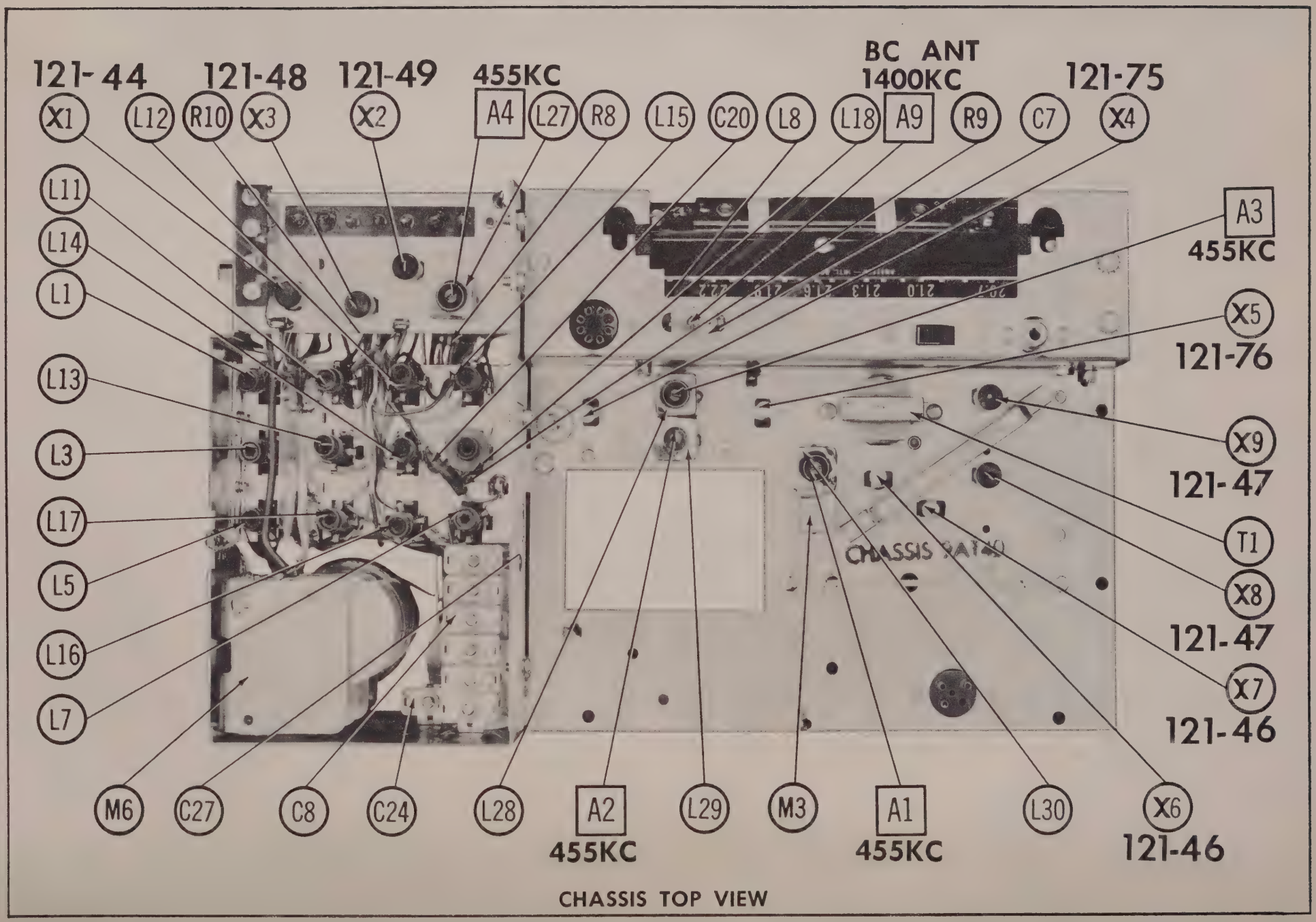
420-14



CHASSIS BOTTOM VIEW - INDUCTOR, RESISTOR & MISC IDENT.



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Use fresh batteries.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400∿ Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	600KC	"	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Note: If A5 has insufficient range, set A5 to mid-position and adjust core of L26 to bring 600KC signal to mid-range setting of A5.
3.		"	1600KC	"	1600KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output. Repeat steps 2 and 3.
4.		"	600KC	"	600KC	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.
5.		"	1400KC	"	1400KC	"	A8, A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 4 and 5.
6.		"	"	"	"	"	A10	Place detachable wave magnet in center of metal framed window. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		3' wire approximately 1' away and parallel with extended whip antenna.	2.1MC	SWI	2.1MC	"	A11, A12, A13	Adjust for maximum output while rocking tuning gang.
8.		"	3.9MC	"	3.9MC	"	A14, A15, A16	Adjust for maximum output. Repeat steps 7 and 8.
9.		"	4.25MC	SWII	4.25MC	"	A17, A18, A19	Adjust for maximum output while rocking tuning gang.
10.		"	8.75MC	"	8.75MC	"	A20, A21, A22	Adjust for maximum output. Repeat steps 9 and 10.
11.		"	9.7MC	SWIII	9.7MC	"	A23, A24, A25	Adjust for maximum output.
12.		"	11.8MC	SWIV	11.8MC	"	A26, A27, A28	"
13.		"	15.2MC	SWV	15.2MC	"	A29, A30, A31	"
14.		"	17.8MC	SWVI	17.8MC	"	A32, A33, A34	"
15.		"	21.6MC	SWVII	21.6MC	"	A35, A36, A37	"

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	121-44	RF Amplifier		2N370		2N370	PNP
X2	121-49	Mixer		2N372		2N372	PNP
X3	121-48	Oscillator		2N371		2N371	PNP
X4	121-75	1st IF Amplifier		2N139	2N483	2N139	PNP
X5	121-76	2nd IF Amplifier		2N139	2N483	2N139	PNP
X6	121-46	AF Amplifier		2N109	2N362	2N109	PNP
X7	121-46	Driver		2N109	2N362	2N109	PNP
X8	121-47	Output		2N270	2N360	2N270	PNP Note 1
X9	121-47	Output		2N270	2N360	2N270	PNP Note 1

Note 1. X8 and X9 are a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	12	22-2883	SRE12V50	BBR5-25	TC29	TD-50-25	MQ-0150	TE-1160
C2	500	12	22-2985	PRS12V500	BR5001	TC1505	TD-500-15	MTH-1250	TVA-1132
C3	10	12	22-2984	SRE25V10	BBR10-25	TC22	TD-10-25	MQ-0510	TE-1128
C4	3	12	22-2884	XPP-12003	NL3-10	TT12X10	ML4-15		TE-1122
C5	50	12	22-2883	SRE12V50	BBR50-25	TC29	TD-50-25	MQ-0150	TE-1160

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

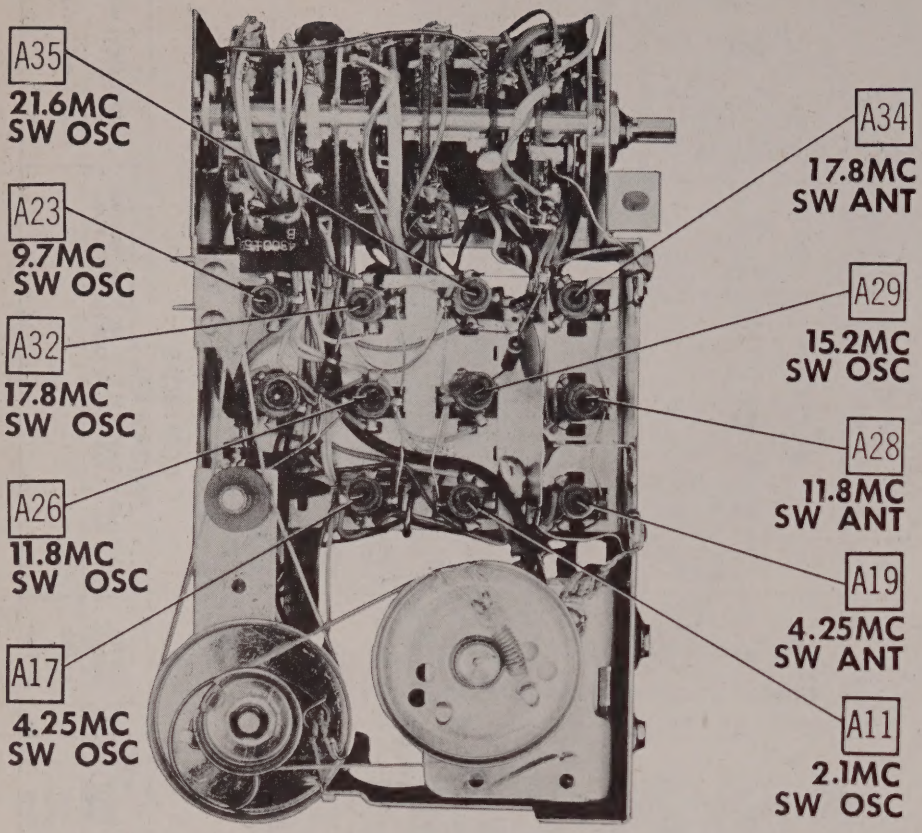
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	5		22-1665	SI 5	D6-050	LT6Q5	ZT-555	5GA-V5	
C7			22-2989						
C8A									
B									
C			22-2969						
D									
E									
F									
C9									
C10	25		22-1392	NPO-SI 25	TCZ-25	CTA6Q25C	ZT-5425	5TCC-Q25	10%
C11	50		22-1761	NPO-SI 50	TCZ-50	CTA6Q5C	ZT-545	5TCC-Q5	10%
C12	50000		22-2728	BPD-05				TG-S50	
C13	50000		22-2728	BPD-05				TG-S50	

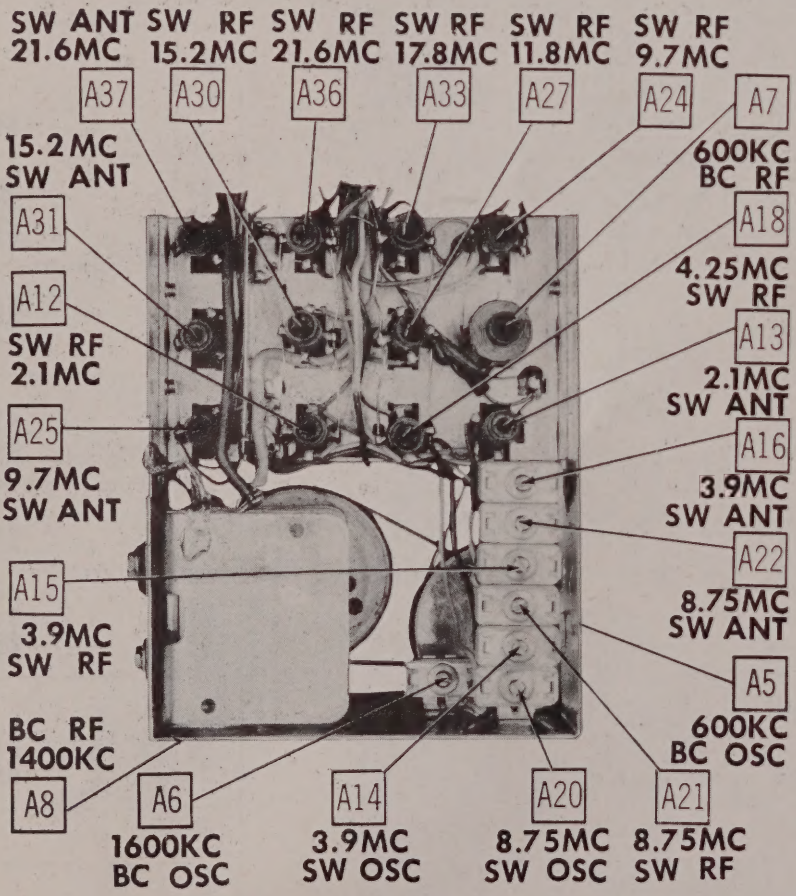
CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C14	50000		22-2728	BPD-05				TG-S50	
C15	.1	50	22-2998	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C16	50000		22-2728	BPD-05				TG-S50	
C17	50000		22-2728	BPD-05				TG-S50	
C18	50		22-1761	NPO-SI 50	TCZ-50	CTA6Q5C	ZT-545	5TCC-Q5	10%
C19	25		22-1392	NPO-SI 25	TCZ-25	CTA6Q25C	ZT-5425	5TCC-Q25	10%
C20	50000		22-2728	BPD-05				TG-S50	
C21	50000		22-2728	BPD-05				TG-S50	
C22	60		22-2979						5%
C23	100		22-3037		TCZ-100				5%
C24			22-2970						
C25	4300		22-2982	1464-0043	1R5D43			MS-243	5%
C26	2700		22-2981	1464-0027	1R5D27			MS-227	5%
C27			22-2282						
C28	2200		22-18	BPD-0022	DD-222	BYA10D22	UC-5222	5GA-D22	
C29	470	1000	22-6	HVD-15-470	DD-471	BYA10T47	DC30347	5GA-T47	
C30	50000		22-2728	BPD-05				TG-S50	
C31	7		22-2978			C10V7C			
C32	50000		22-2728	BPD-05				TG-S50	
C33	22		22-2372		DTZ-22				5%
C34	50000		22-2728	BPD-05				TG-S50	
C35	50000		22-2728	BPD-05				TG-S50	
C36	7		22-2978			C10V7C			
C37	50000		22-2728	BPD-05				TG-S50	
C38	50000		22-2728	BPD-05				TG-S50	
C39	1000	1000	22-17	HVD-15-1000	DD-102	BYA10D1	DC3021	5GA-D1	
C40	50000		22-2728	BPD-05				TG-S50	
C41	10000		22-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C42	.022	50							10%
C43	50000		22-2728	BPD-05				TG-S50	
C44	.0022	200	22-2161						10%
C45	.1	50	22-2987						10%
C46	10000		22-3	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	

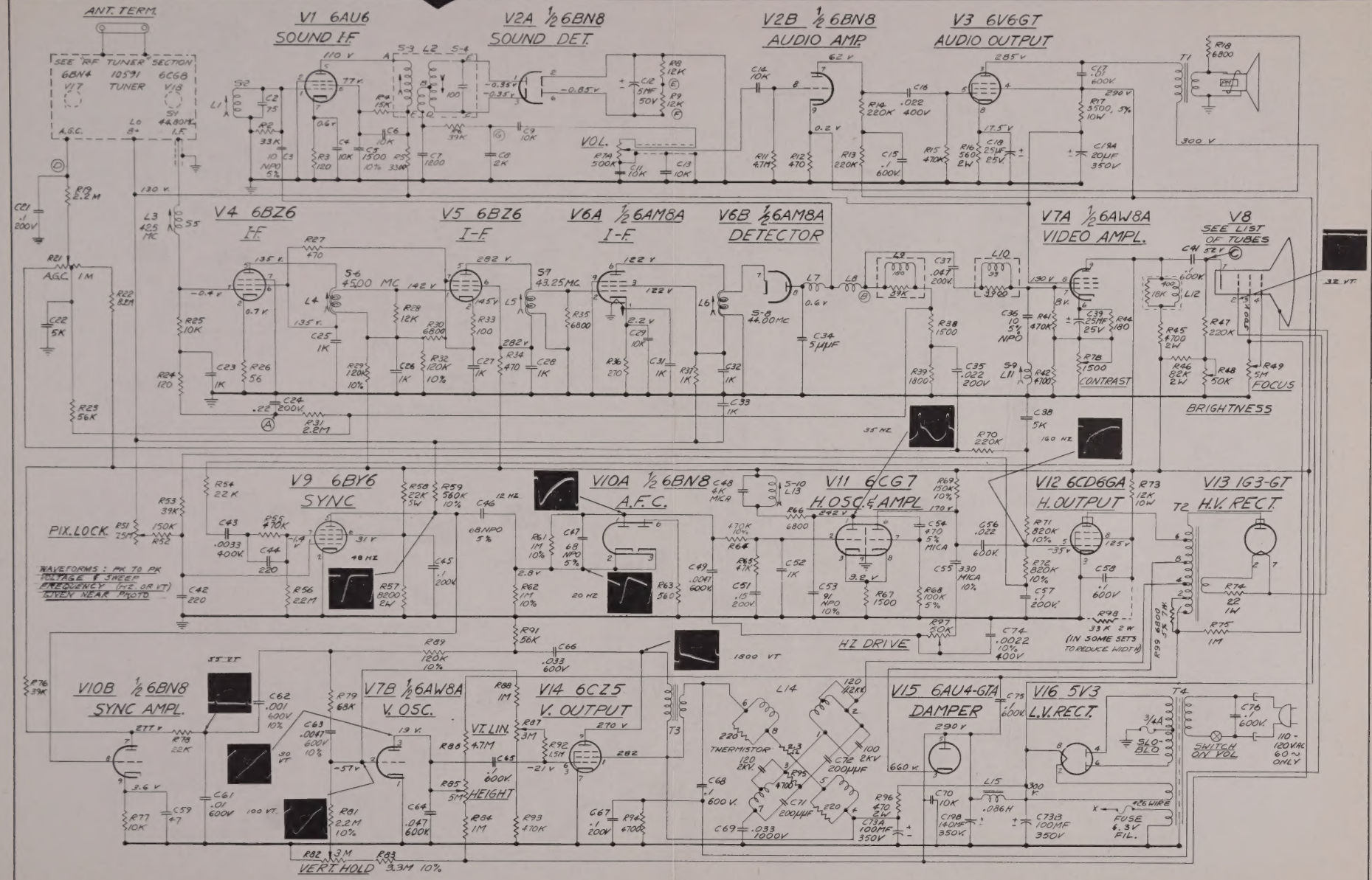
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	200K	½	63-4006					Volume, Tap @ 100K
B	Switch							
R2	1meg	½	63-4018					Tone





RF CHASSIS - ALIGNMENT IDENT.



Packard-Bell Models 21C1, 21C2, 21T2, 24C1 (Ch. 88-5)

Schematic Diagram Courtesy of Packard-Bell Co.

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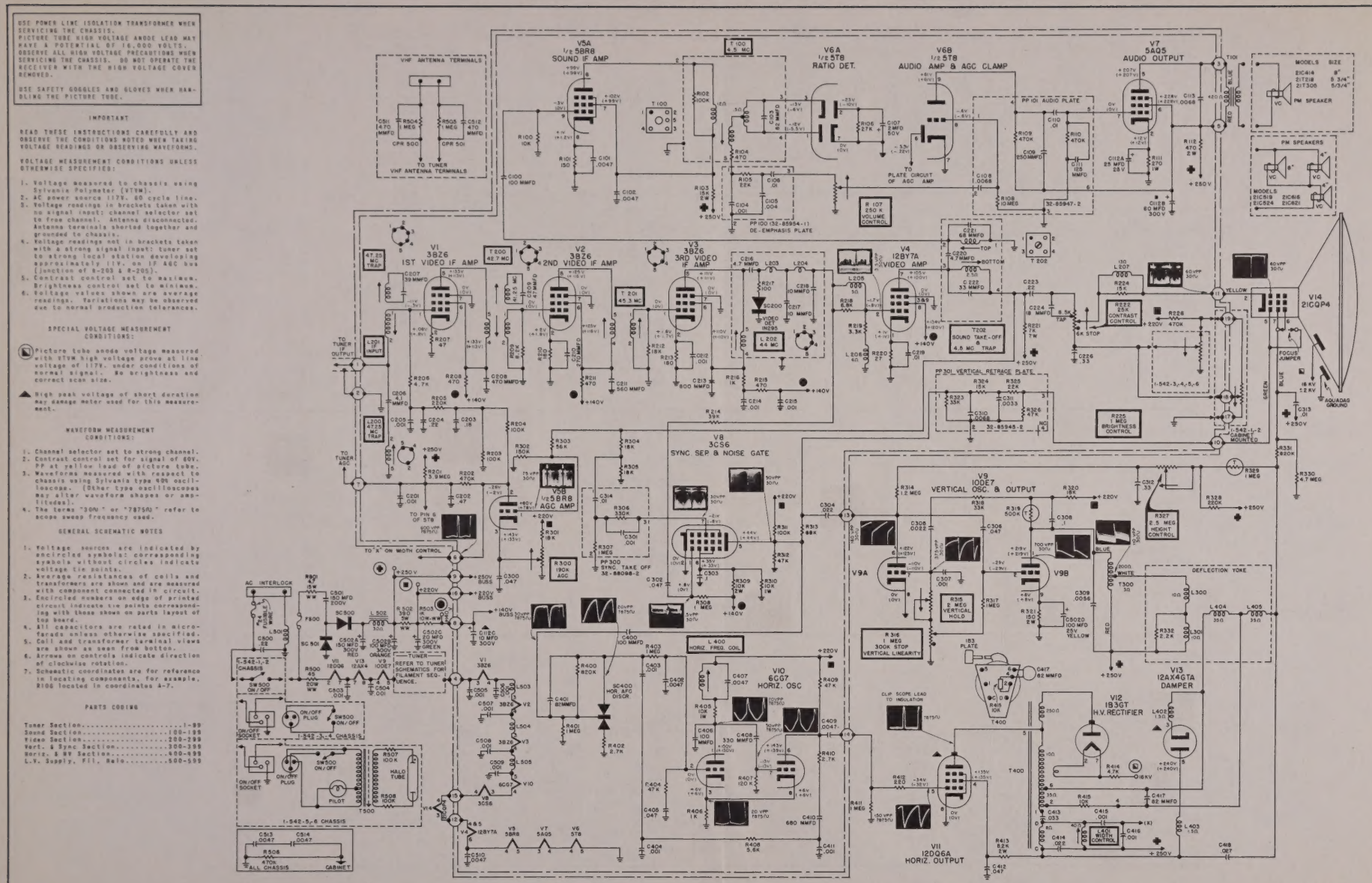
USE POWER LINE ISOLATION TRANSFORMER WHEN SERVICING THE CHASSIS.
PICTURE TUBE HIGH VOLTAGE ANODE LEAD MAY HAVE A POTENTIAL OF 16,000 VOLTS. OBSERVE ALL HIGH VOLTAGE PRECAUTIONS WHEN SERVICING THE CHASSIS. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COVER REMOVED.
USE SAFETY GOGGLES AND GLOVES WHEN HANDLING THE PICTURE TUBE.
IMPORTANT
READ THESE INSTRUCTIONS CAREFULLY AND OBSERVE THE CONDITIONS NOTED WHEN TAKING VOLTAGE READINGS OR OBSERVING WAVEFORMS.
VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED:
1. Voltage measured to chassis using Sylvania Polymeter (VTVM).
2. AC power source 117V., 60 cycle line.
3. Voltage readings in brackets taken with no signal input; channel selector set to free channel. Antenna disconnected. Antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input; tuner set to strong local station developing approximately 11V. on IF AGC bus (junction of R-203 & R-205).
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.
SPECIAL VOLTAGE MEASUREMENT CONDITIONS:
Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 117V. under conditions of normal signal. No brightness and correct scan size.
▲ High peak voltage of short duration may damage meter used for this measurement.
WAVEFORM MEASUREMENT CONDITIONS:
1. Channel selector set to strong channel.
2. Contrast control set for signal of 60V. PP at yellow lead of picture tube.
3. Waveforms measured with respect to chassis using Sylvania type 92M scilloscope. (Other type oscilloscopes may alter waveform shapes or amplitudes).
4. The terms "30V" or "7875U" refer to scope sweep frequency used.
GENERAL SCHEMATIC NOTES
1. Voltage sources are indicated by encircled symbols; corresponding symbols without circles are voltage tie points.
2. Average resistances of coils and transformers are shown and associated with component connected in circuit.
3. Encircled numbers on edge of printed circuit indicate tie points corresponding with those shown on parts layout of top board.
4. All capacitors are rated in microfarads unless otherwise specified.
5. Coil and transformer terminal views are shown as seen from bottom.
6. Arrows on controls indicate direction of clockwise rotation.
7. Schematic coordinates are for reference in locating components. For example, R106 located in coordinates A-7.
PARTS CODING
Tuner Section.....1-99
Sound Section.....100-199
Video Section.....200-299
Vert. & Sync Section.....300-399
Horiz. & HV Section.....400-499
L.V. Supply, Fil. Rels.....500-599
VHF ANTENNA TERMINALS
TO TUNER VHF ANTENNA TERMINALS
V5A 1/2 5BR8 SOUND IF AMP
V6A 1/2 5T8 RATIO DET.
V6B 1/2 5T8 AUDIO AMP & AGC CLAMP
V7 5AQ5 AUDIO OUTPUT
MODELS 21C414 21T218 21T305 SIZE 8" & 5 3/4" 5 3/4"
PM SPEAKER
PM SPEAKERS
MODELS 21C518 21C524 21C616 21C621
R 107 250 K VOLUME CONTROL
32-85947-2
PP100 (32-85954-1) DE-EMPHASIS PLATE
PP101 AUDIO PLATE
TO PLATE CIRCUIT OF AGC AMP
V1 3BZ6 1ST VIDEO IF AMP
V2 3BZ6 2ND VIDEO IF AMP
V3 3BZ6 3RD VIDEO IF AMP
V4 12BY7A 4TH VIDEO AMP
T202 SOUND TAKE-OFF & 4.5 MC TRAP
PP301 VERTICAL RETRACE PLATE
R225 2 MEG BRIGHTNESS CONTROL
R224 15K CONTRAST CONTROL
V14 21CGP4
FOCUS JUMPER
AQUADAG GROUND
CABINET MOUNTED
V8 3CS6 SYNC. SEP. & NOISE GATE
V8B 1/2 5BR8 AGC AMP
PP300 SYNC. TAKE OFF 32-85948-2
TO "A" ON WIDTH CONTROL
TO PIN 5 OF ST8
V9 10DE7 VERTICAL OSC. & OUTPUT
R316 1 MEG 300K STOP VERTICAL LINEARITY
R315 2 MEG VERTICAL HOLD
R327 2.5 MEG HEIGHT CONTROL
V9A
V9B
DEFLECTION YOKE
V13 12AX4GTA DAMPER
V12 1B3GT H.V. RECTIFIER
V11 12DQ6A HORIZ. OUTPUT
V10 6GG7 HORIZ. OSC
L 400 HORIZ. FREQ. COIL
SC400 HOR. AFC DISCR.
AC INTERLOCK
SW500 ON/OFF
ON/OFF PLUG
ON/OFF SOCKET
PILOT
HALO TUBE
1-542-1,-2 CHASSIS
1-542-3,-4 CHASSIS
1-542-5,-6 CHASSIS
TUNER
REFER TO TUNER SCHEMATICS FOR FILAMENT SEQUENCE.
ALL CHASSIS
CABINET

Sylvania Models 21C414, 21C524, 21T218 Series (Ch. 1-542-1, -2, -3, -4, -5, -6)

Schematic Diagram Courtesy of Sylvania Electric Products, Inc.